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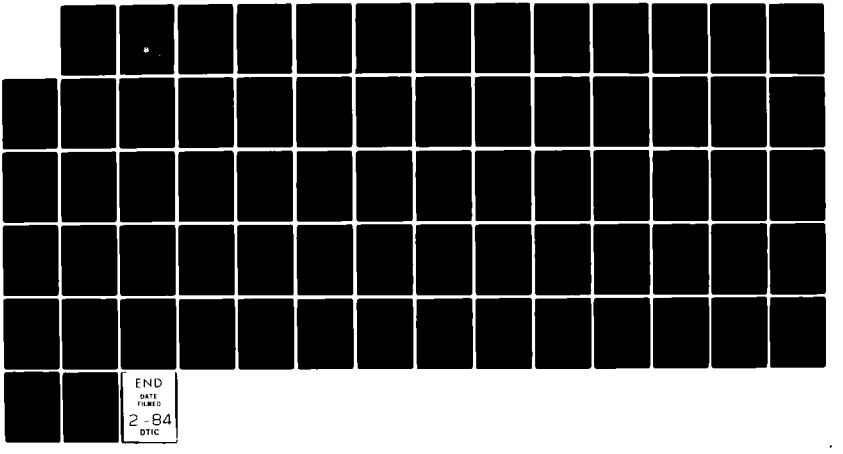

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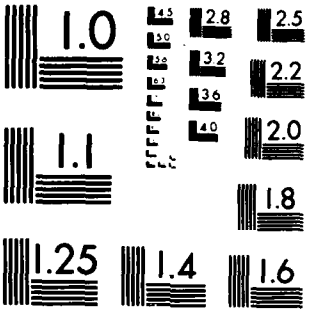

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THE SENTINEL BRIGHT COST MODELS PROGRAM

By
C. M. COLECCHI

JANUARY 1984

Prepared for
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ELECTRONIC SYSTEMS DIVISION
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REVIEW AND APPROVAL

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Three cost models -- the OASIS, the TERCON, and the Air Force Model -- are presently being used to determine the total cost of various Department of Defense programs. In the past, these cost calculations were performed manually. This paper describes the SENTINAL BRIGHT Cost Models Program, a program written to automate the cost projection process.

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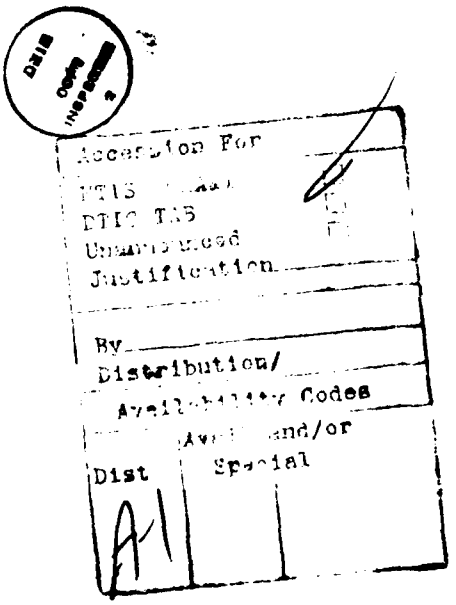


SECTION 1

INTRODUCTION

1.1 GENERAL

In order to estimate budgets for various programs, three cost models--the OASIS model, the Air Force Model, and the TERCON Model--have been developed. The OASIS Model cost elements are based on past experience with the OASIS Program. An "ESD Cost Factor Study" performed by ESD/AC and published in March of 1978 provides the criteria upon which the Air Force Model is based. The TERCON Model was used by MITRE to prepare budget cost estimates for the Semiautomated Terminal Control Center for the COMBAT GRANDE II Program.

Each of these models requires a cost estimate for both the anticipated hardware configuration and the software. The estimates are subsequently multiplied by the appropriate cost model weights to derive total program cost. Previously, each application of a cost model was calculated by hand; "what if" scenarios, during which hardware configurations and software estimates are frequently modified to determine the relationship between total program cost and the hardware and software estimates chosen, resulted in tedious manual recalculations.

This paper describes the software written to automate the cost modeling process.

1.2 PROGRAM OVERVIEW

The SENTINEL BRIGHT Cost Models Program allows the user to create new lists of hardware and modify old ones. A hardware list contains information about the anticipated program hardware configuration, such as the number of central processing units, disc units, printers, and so on, along with respective prices. This information is then used to calculate the total hardware cost associated with the configuration. It is this total cost that is later used as the hardware estimate for a particular cost model run. Hardware lists may also be displayed on the console, sent to the printer for hard copy, or deleted from the directory.

Each of the three cost models allows the user to choose a software estimate from a set of user-defined estimates or select a

new one to serve as input to a particular model run. A listing of the user's file directory is also a Main Menu option.

1.3 PROGRAM DESIGN

The SENTINEL BRIGHT Cost Models Program, written in FORTRAN, is a completely menu-driven system. As such, it guides the user through the various portions of the program. Each submenu has an exit option that returns control to the menu one level above it. If so desired, the Main Menus are eventually displayed and the user may exit the Cost Models Program or step through it once again. Single-letter commands are all that are required to run program modules.

In general, modules rather than subroutines were used to accommodate the various program functions. This reduces parameter passing and minimizes the effort required to alter the program in the future.

1.4 FUTURE DEVELOPMENTS

The three cost models employ various hardware weights or factors which represent the system engineering, development, testing, and other cost elements associated with a hardware suite procurement. Each model makes use of different weights with emphasis placed on different cost elements. These weights may require modification in the future. As the source code is presently written, the programmer must access the appropriate cost model element file and change the weight(s), as well as change the total cost equation in the affected cost model module. The modules must then be recompiled.

It would be useful, then, to develop a utility program that would allow the user to alter the cost elements of any model and automatically recalculate the total cost equation accordingly. This would allow for the simple modification of a cost model without requiring subsequent recompilation.

1.5 DOCUMENT SUMMARY

This document provides the user with the information necessary to project program costs using the OASIS, Air Force, and TERCON Cost Models.

Section 2 addresses the capabilities of the SENTINEL BRIGHT Cost Models Program in detail. Section 3 deals with the utility program, SWFILE, which allows for the creation of a software estimate file. A User's Manual is contained in Appendix A and the cost elements of each of the three cost models are included in Appendix B. Appendix C contains the information required to execute the SWFILE utility program, and Appendix D consists of a program design chart. A listing of the source code is in Appendix E.

SECTION 2

THE SENTINEL BRIGHT COST MODELS PROGRAM

2.1 THE MAIN MODULE

The main module consists of a TSO programmable CLIST (command list) which displays the Main Menu and, depending upon the option exercised, loads the appropriate FORTRAN object module for execution. The CLIST also handles the creating of new files and the deletion and retrieval of old files, listing the user's file directory, and obtaining file hard copy.

2.1.1 The Main Menu

The Main Menu consists of the following:

```
** MENU OF OPTIONS **

C)REATE HARDWARE LIST
A)LTER HARDWARE LIST
R)EMOVE HARDWARE LIST
D)ISPLAY HARDWARE LIST
P)RINT FILE
O)ASIS MODEL
U)SAF MODEL
T)ERCON MODEL
L)IST FILE DIRECTORY
    E)XIT SYSTEM

PLEASE ENTER CORRESPONDING SINGLE-LETTER COMMAND
```

The user selects an option by typing the appropriate letter. When the requested action or set of actions is complete, the Main Menu of options is again displayed.

2.2 CREATING A HARDWARE LIST

A hardware list consists of the various pieces of hardware that make up a particular hardware configuration, the price of each piece of hardware, the total number of each unit needed, and the number of development and/or production units required.

When the user opts to create a new hardware list, the program prompts for a file name. The file is then created and the user is guided by further prompts to complete the hardware list. For instance, the user is asked to enter the hardware identification, the unit cost, the number of units needed, and so on. As the data is entered, a sequence number is automatically assigned to each record. After each piece of hardware is entered, all of the previously entered units are displayed on the console for viewing, and a running total of hardware costs is displayed. When the hardware list is complete, the user exits by pressing the 'carriage return' when prompted for the hardware identification. The file is saved automatically and the Main Menu is displayed.

2.3 ALTERING A HARDWARE LIST

In order to alter an existing hardware list, the user is asked to enter the name of the file to be modified. The contents of the file are then displayed on the console along with the following prompt:

```
WOULD YOU LIKE TO:

 M)ODIFY A RECORD
 D)ELETE A RECORD
 A)DD A RECORD
 I)NSERT A RECORD
   E)XIT
```

If the modify option is chosen, the sequence number of the record to be altered is entered, the user makes the appropriate changes, and the above prompt is displayed once again. The user may delete, modify, or insert a record, add a number of records to the hardware list, or exit back to the Main Menu. All changes to a file are saved automatically (i.e., originals are lost) upon exiting the submenu.

2.4 REMOVING, DISPLAYING, OR PRINTING A HARDWARE LIST

When removing a hardware list from the file directory, the user merely specifies the name of the file to be deleted. Similarly, if the user wishes to display the contents of a file on the console or get a hard copy of a file, the appropriate option is selected and the correct file name is entered. The CLIST then issues the appropriate operating system command.

2.5 THE OASIS MODEL

To run the OASIS Model, the user is asked to specify the name of the file containing the hardware list to be used in the calculation. The OASIS cost model elements (see Appendix B) are then displayed on the console along with all of the "current" software estimates. "Current" software estimates consist of the following: estimates that have been entered into a software file through the use of a utility program (see Section 3), or software estimates that have been entered into the software file by the user during previous cost model runs.

The user may now select a "current" estimate to be used as the software value in the cost calculation, or enter a new one that is automatically saved on file and retrieved as a "current" estimate during the next cost model run.

After having defined both the hardware and software estimates, the user may opt to run the model, and the total cost for a particular project under the given hardware and software cost constraints is calculated and displayed on the console. The results of the calculation are written to an output file for future hard-copy and/or retrieval.

2.6 THE AIR FORCE AND TERCON MODELS

The Air Force and TERCON Models are set up in the same manner as the OASIS Model. Once the user chooses to run a model, the hardware file must be specified and a software estimate selected. The cost model elements of each model are displayed. Once again, the projected costs are displayed on the console and saved on file. The user may run a model several times with different input parameters or return to the Main Menu.

SECTION 3

THE SOFTWARE FILE UTILITY PROGRAM

A utility program called SWFILE allows the user to create a file in which to store various software estimates. Prompts for the software value, any comments, and date guide the user in creating the file that is saved automatically upon exiting the program. This file is subsequently read from disc and its contents displayed on the console during a cost model run. As explained in Sections 2.5 and 2.6, the user may then add software estimates to the file and/or select an existing estimate with which to run the model. Because this program will probably only be used initially to create the file, since any additions can be handled during a cost model run, the program was not incorporated into the main body of the SENTINEL BRIGHT Cost Models Program.

APPENDIX A

SENTINEL BRIGHT COST MODELS PROGRAM USER'S MANUAL

A.1 INTRODUCTION

This manual serves to demonstrate the operation of the SENTINAL BRIGHT Cost Models Program. The various responses to the program prompts in the following pages are merely examples used to illustrate program functions.

A.2 GETTING STARTED

A.2.1 Invoking the SENTINEL BRIGHT Cost Models Program

The SENTINEL BRIGHT Cost Models Program runs on an IBM 4341 under the TSO operating system. In order to invoke the program after logging on,

KEY: EXEC SBCOST

The program will respond with the Main Menu:

MENU OF OPTIONS

C)REATE HARDWARE LIST
A)LTER HARDWARE LIST
R)EMOVE HARDWARE LIST
D)ISPLAY HARDWARE LIST
P)RINT FILE
O)ASIS MODEL
U)SAF MODEL
T)ERCON MODEL
L)IST FILE DIRECTORY
E)XIT SYSTEM

PLEASE ENTER CORRESPONDING SINGLE-LETTER COMMAND

A.3 EXAMPLE 1: CREATING A HARDWARE LIST

If the CREATE option is to be exercised,

KEY: C

The system responds with:

```
ENTER NEW FILE NAME:
```

KEY: TEST.DATA (the extension .DATA must be specified)

In a few moments the system responds with the message:

```
TEST.DATA HAS BEEN CREATED
PLEASE ENTER THE FOLLOWING INFORMATION.
IF HARDWARE LIST IS COMPLETE,
PRESS 'RETURN' WHEN PROMPTED FOR 'IDENTIFICATION'.

ENTER HARDWARE IDENTIFICATION:
```

KEY: CPU

```
ENTER UNIT COST IN THOUSANDS:
?(1)
```

KEY: 250

```
ENTER TOTAL NUMBER OF UNITS NEEDED:
?
```

KEY: 3

```
ENTER NUMBER OF DEVELOPMENT UNITS:
?
```

KEY: 1

```
ENTER NUMBER OF PRODUCTION UNITS:
?
```

KEY: 2

NOTE:

(1) When looking for a number, a question mark will appear after the written prompt. The user must wait until the ? appears before keying response.

After the number of production units is entered, the program calculates the cost of the hardware and displays it as follows:

IDENTIFICATION	UNIT COST	NO.	DEVELOPMENT	PRODUCTION	TOTAL COST
**********	*********	***	**********	**********	**********
1 CPU	250.0	3	1	2	750.0
TOTALS			250.0K	500K	750.0K

The program continues to prompt for a second piece of hardware:

```
      ENTER HARDWARE IDENTIFICATION:
KEY:  TERMINALS
      ENTER UNIT COST IN THOUSANDS
      ?
KEY:  15
      ENTER TOTAL NUMBER OF UNITS NEEDED:
      ?
KEY:  100
      ENTER NUMBER OF DEVELOPMENT UNITS:
      ?
KEY:  20
      ENTER NUMBER OF PRODUCTION UNITS:
      ?
KEY:  80
```

IDENTIFICATION	UNIT COST	NO.	DEVELOPMENT	PRODUCTION	TOTAL COST
**********	*********	***	**********	**********	**********
1 CPU	250.0	3	1	2	750.0
2 TERMINALS	15.0	100	20	80	1500.0
TOTALS			550.0K	1.7M	2.3M

ENTER HARDWARE IDENTIFICATION:

If at this point the hardware list is complete, press the 'RETURN' key. The program then displays the following message:

YOUR FILE HAS BEEN SAVED

The program now returns back to the Main Menu.

A.4 EXAMPLE 2: ALTERING A HARDWARE LIST

** MENU OF OPTIONS **

C)REATE HARDWARE LIST
A)LTER HARDWARE LIST
R)EMOVE HARDWARE LIST
D)ISPLAY HARDWARE LIST
P)RINT FILE
O)OASIS MODEL
U)SAF MODEL
T)ERCON MODEL
L)IST FILE DIRECTORY
E)XIT SYSTEM

PLEASE ENTER CORRESPONDING SINGLE-LETTER COMMAND

To alter an existing hardware list:

KEY: A

The program responds:

ENTER FILE NAME:

KEY: TEST.DATA

The contents of TEST.DATA are displayed on the console.

IDENTIFICATION	UNIT COST	NO.	DEVELOPMENT	PRODUCTION	TOTAL COST
**********	*********	***	**********	**********	**********
1 CPU	250.0	3	1	2	750.0
2 TERMINALS	15.0	100	20	80	1500.0
TOTALS			550.0K	1.7M	2.3M

WOULD YOU LIKE TO:

M)ODIFY A RECORD
D)ELETE A RECORD
A)DD A RECORD
I)NSERT A RECORD
E)XIT

A.4.1 Adding a Record

The user now selects the type of modification to be completed. For example, to add a record:

KEY: A

The program responds with:

ONCE RECORD(S) ARE ADDED PRESS 'RETURN'
WHEN PROMPTED FOR 'IDENTIFICATION'

ENTER HARDWARE IDENTIFICATION:

KEY: PRINTERS

ENTER UNIT COST IN THOUSANDS:
?

KEY: 5

ENTER TOTAL NUMBER OF UNITS NEEDED:
?

KEY: 4

ENTER NUMBER OF DEVELOPMENT UNITS:
?

KEY: 0

ENTER NUMBER OF PRODUCTION UNITS:
?

KEY: 4

The contents of the file, along with new record(s) are displayed.

IDENTIFICATION	UNIT COST	NO.	DEVELOPMENT	PRODUCTION	TOTAL COST
**********	*********	***	**********	**********	**********
1 CPU	250.0	3	1	2	750.0
2 TERMINALS	15.0	100	20	80	1500.0
3 PRINTERS	5.0	4	0	4	20.0
TOTALS			550.0K	1.7M	2.3M

The program continues prompting for additional records,

ENTER HARDWARE IDENTIFICATION:

A.4.2 Modifying a Record

At this point, the user may add additional records or press the 'RETURN' key. Assuming that the latter action is performed, the program returns to the prompt:

WOULD YOU LIKE TO:

M)ODIFY A RECORD
D)ELETE A RECORD
A)DD A RECORD
I)NSERT A RECORD
E)XIT

To modify a record:

KEY: M

The program responds:

WHICH RECORD WOULD YOU LIKE TO MODIFY?
?

KEY: 2

The record specified then appears on the console along with the following prompt:

IDENTIFICATION	UNIT COST	NO.	DEVELOPMENT	PRODUCTION	TOTAL COST
**********	*********	***	**********	**********	**********
2 TERMINALS	15	100	20	80	1500.0

MODIFY I)DENTIFICATION, UNIT COST, N)O. OF UNITS,
D)EVELOPMENT, P)RODUCTION T)OTAL COST,
E)XIT?

To modify unit cost:

KEY: U

The program prompts:

ENTER UNIT COST IN THOUSANDS:
?

KEY: 20

The program responds:

RECORD NO. 2 NOW LOOKS LIKE THIS:

IDENTIFICATION	UNIT COST	NO.	DEVELOPMENT	PRODUCTION	TOTAL COST
**********	*********	***	**********	**********	**********
2 TERMINALS	20.0	100	20	80	2000.0

The unit cost has been altered and the total cost recalculated. The contents of the entire file are then displayed on the console along with:

WOULD YOU LIKE TO:

M)ODIFY A RECORD
D)ELETE A RECORD
A)DD A RECORD
I)NSERT A RECORD
E)XIT

Before moving on to inserting and deleting a record, there is another point that should be made concerning modifying a record. As mentioned above, when the user wishes to modify a record, the program prompts for the section of the record to be altered--i.e., the hardware identification, unit cost, number of units, development and production units, or the total cost.

The user can alter the number of development and/or production units without modifying the total number of units manually. The program accepts development and production unit changes and automatically modifies the total number of units accordingly. When the user opts to alter the total number of units required, the program once again accepts the modification and then prompts the user:

REENTER D)EVELOPMENT, P)RODUCTION UNITS, B)OTH, OR N)EITHER?

in anticipation of any further action that might be necessary. For example, the user may have incorrectly entered the total number of

units required and not wish to modify any other entries. Or it may be necessary to reflect a change in the total number of units in terms of the development and/or production units. Hence, the program accommodates all of the possibilities. When all modifications are complete, the contents of the file are displayed on the console.

A.4.3 Inserting and Deleting a Record

IDENTIFICATION **********	UNIT COST *********	NO. ***	DEVELOPMENT **********	PRODUCTION **********	TOTAL COST **********
1 CPU	250.0	3	1	2	750.0
2 TERMINALS	20.0	100	20	80	2000.0
3 PRINTER	5.0	4	0	4	20.0
TOTALS			650.0K	2120.0K	2.8M

WOULD YOU LIKE TO:

M)ODIFY A RECORD
D)ELETE A RECORD
A)DD A RECORD
I)NSERT A RECORD
E)XIT

To delete a record,

KEY: D

The program responds with:

WHICH RECORD WOULD YOU LIKE TO DELETE?

KEY: 2

The contents of the altered file are displayed for the user.

IDENTIFICATION	UNIT COST	NO.	DEVELOPMENT	PRODUCTION	TOTAL COST
**********	*********	***	**********	**********	**********
1 CPU	250.0	3	1	2	750.0
2 PRINTER	5.0	4	0	4	20.0
TOTALS			250.0K	520.0K	770.0K

WOULD YOU LIKE TO:

M)ODIFY A RECORD
D)ELETE A RECORD
A)DD A RECORD
I)NSERT A RECORD
E)XIT

In order to insert a record

KEY: I

The program asks:

AFTER WHICH RECORD WOULD YOU LIKE TO INSERT A RECORD?
?

KEY: 1

The program guides the user:

ENTER HARDWARE IDENTIFICATION:

KEY: MODEMS

ENTER TOTAL NUMBER OF UNITS NEEDED:
?

KEY: 20

ENTER NUMBER OF DEVELOPMENT UNITS:
?

KEY: 0

```
ENTER NUMBER OF PRODUCTION UNITS:
?
```

KEY: 20

After the number of production units is entered, the file is again displayed on the console.

IDENTIFICATION	UNIT COST	NO.	DEVELOPMENT	PRODUCTION	TOTAL COST
**********	*********	***	**********	**********	**********
1 CPU	250.0	3	1	2	750.0
2 MODEMS	.2	20	0	20	4.0
3 PRINTER	5.0	4	0	4	20.0
TOTALS			250.0K	524.0K	774.0K

```
WOULD YOU LIKE TO:

 M)ODIFY A RECORD
 D)ELETE A RECORD
 A)DD A RECORD
 I)NSERT A RECORD
    E)XIT
```

To return to the Main Menu:

KEY: E

A.5 EXAMPLE 3: DISPLAYING A HARDWARE LIST

```
**MENU OF OPTIONS**

C)REATE HARDWARE LIST
A)LTER HARDWARE LIST
R)EMOVE HARDWARE LIST
D)ISPLAY HARDWARE LIST
P)RINT FILE
O)ASIS MODEL
U)SAF MODEL
T)ERCON MODEL
L)IST FILE DIRECTORY
    E)XIT SYSTEM

PLEASE ENTER CORRESPONDING SINGLE-LETTER COMMAND
```

If the user wants to take a look at a hardware list before running a cost model to determine if, for instance, the hardware list must be altered, or if it is the correct file to use for a particular cost model run, the program allows the user to display the contents of a file on the console.

KEY: D

The program replies:

ENTER FILE NAME:

KEY: TEST.DATA

and the file is displayed.

IDENTIFICATION	UNIT COST	NO.	DEVELOPMENT	PRODUCTION	TOTAL COST
**********	*********	***	**********	**********	**********
1 CPU	250.0	3	1	2	750.0
2 MODEMS	.2	20	0	20	4.0
3 PRINTER	5.0	4	0	4	20.0
TOTALS			250.0K	524.0K	774.0K

A.6 EXAMPLE 4: PRINTING A FILE

```
**MENU OF OPTIONS**

C)REATE HARDWARE LIST
A)LTER HARDWARE LIST
R)EMOVE HARDWARE LIST
D)ISPLAY HARDWARE LIST
P)RINT FILE
O)ASIS MODEL
U)SAF MODEL
T)ERCON MODEL
L)IST FILE DIRECTORY
    E)XIT SYSTEM

PLEASE ENTER CORRESPONDING SINGLE-LETTER COMMAND
```

In order to get a hard copy of a file--a hardware list, the software estimate file, or an output file which stores various cost modeling results,

KEY: P

and the program states:

```
ENTER FILE NAME:
```

KEY: TEST.DATA

After a few moments, the program responds:

```
PROCESSING ENDED AT EOD

PRINT ANOTHER FILE?

Y)ES
OR
N)O
```

The user enters the appropriate response. Once the file(s) have been sent to the printer for hard copy and the N)O option specified, the program returns to the Main Menu.

A.7 THE OASIS, TERCON, AND AIR FORCE COST MODELS

```
**MENU OF OPTIONS**

C)REATE HARDWARE LIST
A)LTER HARDWARE LIST
R)EMOVE HARDWARE LIST
D)ISPLAY HARDWARE LIST
P)RINT FILE
O)ASIS MODEL
U)SAF MODEL
T)ERCON MODEL
L)IST FILE DIRECTORY
    E)XIT SYSTEM

PLEASE ENTER CORRESPONDING SINGLE-LETTER COMMAND
```

Since the process by which a cost model is run is exactly the same for each model, the OASIS Cost Model will serve as the example for the three models.

To run the OASIS Model,

KEY: O

The program responds:

ENTER FILE NAME CONTAINING HARDWARE LIST:

KEY: TEST.DATA

ENTER SOFTWARE ESTIMATE FILE NAME:

KEY: SW.DATA(1)

NOTE:

(1) The software estimate file name is the name of the file containing one or more of the software estimates to be used in the cost calculation. It is created using the utility program SW.FILE. See Appendix C.

The program then prompts for an output file, the file in which the results of the cost model are to be stored for future reference.

```
WOULD YOU LIKE TO:

C)REATE A NEW OUTPUT FILE
R)ETRIEVE AN OLD ONE
```

KEY: C

```
ENTER NEW OUTPUT FILE NAME:
```

KEY: OASIS.DATA

The OASIS Cost Model elements are now displayed on the console.

OASIS COST MODEL ELEMENTS

HARDWARE COST		HW
SUPPORT MATERIAL (SPARES, MANUALS, LICENCES, DIAGNOSTIC KITS, ETC.)	1.00	HW
SUBCONTRACT MAINTENANCE	.24	HW
LABOR (ENGINEERING)	.80	HW*
BURDEN	.80	HW*
OTHER DIRECT COSTS	.20	HW*
SUBTOTAL	4.04	HW
G & A @ 15% OF SUBTOTAL	.61	HW
FEE @ 12% OF SUBTOTAL	.48	HW
HARDWARE FACTORS	5.13	HW
SOFTWARE		SW
TOTAL COST	5.13	HW' + 2.85 HW + SW

WHERE HW' = COST OF PRIME SET OF HARDWARE
HW = COST OF REMAINING HARDWARE

*THESE FACTORS APPLY TO THE PRIME SET OF HARDWARE ONLY.

The software estimates contained in the software estimate file specified earlier are also displayed.

CURRENT SOFTWARE ESTIMATES DISPLAYED IN MILLIONS

	VALUE	COMMENTS	DATE
1	3.40	JENSEN	3 MAR 83
2	4.20	CMC	3 MAR 83

WOULD YOU LIKE TO:

A)DD A NEW SOFTWARE ESTIMATE
C)HOOSE AN OLD ONE
R)UN COST MODEL
E)XIT

To add an estimate to the file,

KEY: A

The program subsequently prompts:

ENTER SOFTWARE ESTIMATE:
(INCLUDE DECIMAL POINT)

KEY: 5.7

ENTER COMMENTS:

KEY: JENSEN

ENTER DATE:

KEY: 30 MAR 83

CURRENT SOFTWARE ESTIMATES DISPLAYED IN MILLIONS

	VALUE	COMMENTS	DATE
1	3.40	JENSEN	3 MAR 83
2	4.20	CMC	3 MAR 83
3	5.70	JENSEN	30 MAR 83

All of the "current" software estimates are displayed along with:

```
WOULD YOU LIKE TO:

A)DD A NEW SOFTWARE ESTIMATE
C)HOOSE AN OLD ONE
R)UN COST MODEL
E)XIT
```

To select an "old" software estimate:

KEY: C

```
WHICH ESTIMATE?
?
```

KEY: 2

The program once again responds with the following prompt:

```
WOULD YOU LIKE TO:

A)DD A NEW SOFTWARE ESTIMATE
C)HOOSE AN OLD ONE
R)UN COST MODEL
E)XIT
```

This prompt is displayed in order to give the user the opportunity to exit at any time, for example, if the wrong estimate was inadvertently chosen.

To run the OASIS Model,

KEY: R

ENTER TODAY'S DATE:

KEY: 30 MAR 83

The results of the calculation are displayed on the console and written to the specified output file.

30 MAR 1983

CASE 1 **********

THE SOFTWARE ESTIMATE IS:	4.20M
THE HARDWARE DEVELOPMENT COSTS ARE:	6.4M
THE HARDWARE PRODUCTION COSTS ARE:	4.4M
**THE OASIS MODEL COST ESTIMATE IS:	49.6M

The software estimates are now displayed and the user has the option of running the Cost Model once again.

CURRENT SOFTWARE ESTIMATES DISPLAYED IN MILLIONS

	VALUE	COMMENTS	DATE
1	3.40	ME	3 MAR 83
2	4.20	ME	3 MAR 83
3	5.70	JENSEN	30 MAR 83

WOULD YOU LIKE TO:

A)DD A NEW SOFTWARE ESTIMATE
C)HOOSE AN OLD ONE
R)UN COST MODEL
E)XIT

To run the model with another software estimate,

KEY: C

WHICH ESTIMATE?
?

KEY: 1

WOULD YOU LIKE TO:

A)DD A NEW SOFTWARE ESTIMATE
C)HOOSE AN OLD ONE
R)UN COST MODEL
E)XIT

KEY: R

And the results are calculated and displayed.

CASE 2 **********

THE SOFTWARE ESTIMATE IS: 3.40M
THE HARDWARE DEVELOPMENT COSTS ARE: 6.4M
THE HARDWARE PRODUCTION COSTS ARE: 4.4M

**THE OASIS MODEL COST ESTIMATE IS: 48.8M

CURRENT SOFTWARE ESTIMATES DISPLAYED IN MILLIONS

	VALUE	COMMENTS	DATE
1	3.40	ME	3 MAR 83
2	4.20	ME	3 MAR 83
3	5.70	JENSEN	30 MAR 83

WOULD YOU LIKE TO:

A)DD A NEW SOFTWARE ESTIMATE
C)HOOSE AN OLD ONE
R)UN COST MODEL
E)XIT

KEY: E (to exit)

A.8 REMOVING A HARDWARE LIST FROM THE FILE DIRECTORY

```
**MENU OF OPTIONS**

C)REATE HARDWARE LIST
A)LTER HARDWARE LIST
R)EMOVE HARDWARE LIST
D)ISPLAY HARDWARE LIST
P)RINT FILE
O)ASIS MODEL
U)SAF MODEL
T)ERCON MODEL
L)IST FILE DIRECTORY
    E)XIT SYSTEM

PLEASE ENTER CORRESPONDING SINGLE-LETTER COMMAND
```

To remove or delete a hardware list from the file directory,

KEY: R

The program then asks the user:

REMOVE WHICH FILE?

KEY: TEST.DATA

When the file has been deleted, the message,

TEST.DATA HAS BEEN DELETED

appears on the screen. The Main Menu is then displayed on the console.

A.9 LIST FILE DIRECTORY

MENU OF OPTIONS

C)REATE HARDWARE LIST
A)LTER HARDWARE LIST
R)EMOVE HARDWARE LIST
D)ISPLAY HARDWARE LIST
P)RINT FILE
O)ASIS MODEL
U)SAF MODEL
T)ERCON MODEL
L)IST FILE DIRECTORY
E)XIT SYSTEM

PLEASE ENTER CORRESPONDING SINGLE-LETTER COMMAND

To obtain a listing of the file directory, simply

KEY: L

and the program will display on the console all the files contained in the user's directory and return to the Main Menu.

A.10 EXITING THE PROGRAM

To exit the SENTINEL BRIGHT Cost Models Program,

KEY: E

Shortly thereafter, the prompt

READY

will appear. This signifies that control has been returned to the TSO operating system, from which the user can execute another program, log off, and so on.

APPENDIX B

THE COST MODELS

B.1 THE OASIS COST MODEL

The following is a list of the OASIS Cost Model elements, upon which the hardware weights are derived.

OASIS COST MODEL ELEMENTS

HARDWARE COST		HW
SUPPORT MATERIAL (SPARES, MANUALS LICENCES, DIAGNOSTIC KITS, ETC.)	1.00	HW
SUBCONTRACT MAINTENANCE	.24	HW
LABOR (ENGINEERING)	.80	HW*
BURDEN	.80	HW*
OTHER DIRECT COSTS	.20	HW*
SUBTOTAL	4.04	HW
G & A @ 15% OF SUBTOTAL	.61	HW
FEE @ 12% OF SUBTOTAL	.48	HW
HARDWARE FACTORS	5.13	HW
SOFTWARE		SW
TOTAL COST	5.13	HW' + 2.85 HW + SW

WHERE HW' = COST OF PRIME SET OF HARDWARE
HW = COST OF REMAINING HARDWARE

*THESE FACTORS APPLY TO THE PRIME SET OF HARDWARE ONLY.

B.2 THE AIR FORCE COST MODEL

The following includes the Air Force Cost Model elements.

AIR FORCE COST MODEL ELEMENTS

HARDWARE		HW
HARDWARE ENGINEERING	.25	HW
INTEGRATION & ASSEMBLY (.09-.14)*	.10	PME
SUBTOTAL PME (TOTAL OF ABOVE)	1.25 HW + .10 PME = 1.40 HW	
TEST & EVALUATION (.18-.25)	.25	PME
DATA (.16-.22)	.10	PME
PECULIAR SUPPORT EQUIPMENT (.01-.02)	.00	PME
SPARES (.19-.22)	.00	PME
OPERATIONAL SITE ACTIVATION (.03-.05)	.05	PME
SUBTOTAL SUPPORT COSTS	.40	PME
SOFTWARE		SW
SYSTEM ENGINEERING	.23 (PME + SW) = .28 HW + .20	
TOTAL COST	2.65 HW + 1.20 SW	

*RANGE OF VALUES PRESENTED IN THE STUDY

B.3 THE TERCON COST MODEL

The TERCON Cost Model elements are as follows:

TERCON COST MODEL ELEMENTS

HARDWARE		HW
CABLES & INSTALLATION KITS	.05	HW
PME (TOTAL OF ABOVE)	1.05	HW
SOFTWARE		SW
FACILITIES	.01 PME	
DT&E	.30 PME + .20 SW	
SYSTEM ENGINEERING	.15 PME + .15 SW	
R/M/A	.01 PME	
PROGRAM MANAGEMENT	.15 PME + .15 SW	
CONFIGURATION MANAGEMENT	.01 PME + .01 SW	
PACKING	.01 PME	
TRANSPORTATION	.02 PME	
QUALITY ASSURANCE	.01 PME + .01 SW	
DATA	.15 PME + .05 SW	
SUPPORT EQUIPMENT	.03 PME	
ACQUISITION SPARES	.04 PME	
TOTAL SUPPORT COSTS	.89 PME + .57 SW	
TOTAL DIRECT COSTS	1.98 HW + 1.57 SW	
INDIRECT COSTS	.35 (1.98 HW + 1.57 SW)	
TOTAL COST	2.65 HW + 2.10 SW	

APPENDIX C

SOFTWARE ESTIMATES FILE UTILITY PROGRAM

SWFILE is a TSO programmable CLIST that creates a file in which to store the various software estimates used in the cost calculations.

To execute the utility program SWFILE,

KEY: EXEC SWFILE

The program prompts:

ENTER SOFTWARE ESTIMATE FILE NAME:

KEY: (e.g., SW.DATA)

ENTER SOFTWARE ESTIMATE IN MILLIONS:
(INCLUDE DECIMAL POINT)

KEY: 4.2

ENTER COMMENTS:

KEY: JENSEN

ENTER DATE:

KEY: 7 MAR 83

ENTER SOFTWARE ESTIMATE IN MILLIONS:
(INCLUDE DECIMAL POINT)

KEY: 3.8

ENTER COMMENTS:

KEY: CMC

ENTER DATE:

KEY: 10 MAR 83

The program again displays all of the estimates.

	VALUE	COMMENTS	DATE
1	4.2	JENSEN	7 MAR 83
2	3.8	CMC	10 MAR 83

ENTER SOFTWARE ESTIMATE IN MILLIONS:
(INCLUDE DECIMAL POINT)

When all estimates have been entered, press 'RETURN' to exit program when prompted for the next software estimate.

The program automatically saves the contents of the file under the name specified and informs the user,

YOUR FILE HAS BEEN SAVED

The "READY" prompt will appear and the system is waiting to accept any TSO operating system command.

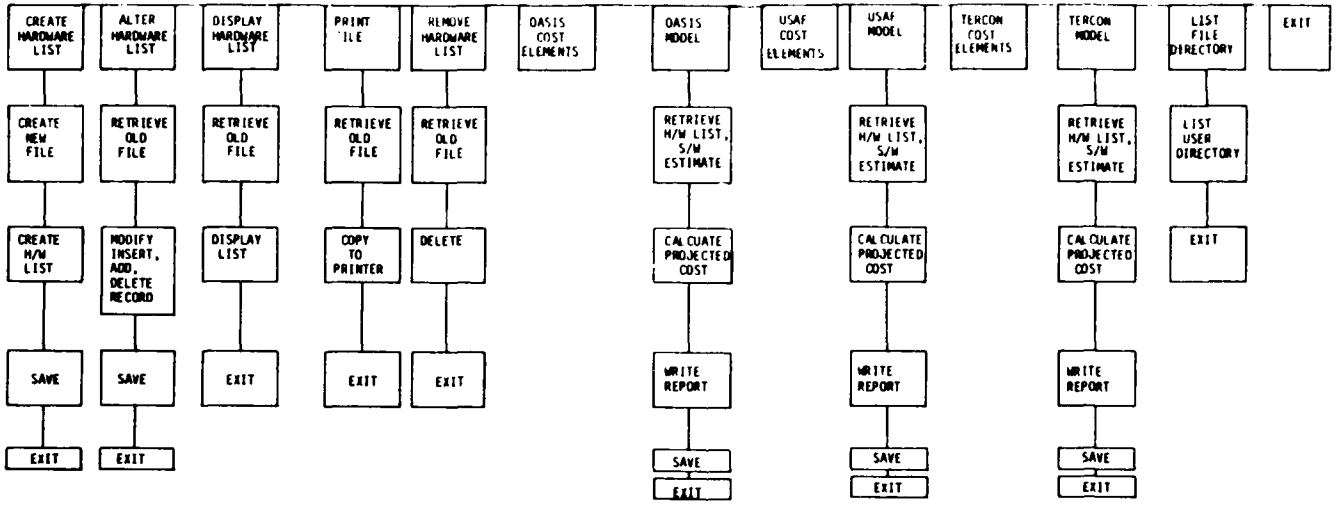
APPENDIX D

PROGRAM DESIGN CHART

THE SENTINEL BRIGHT COST MODELS PROGRAM

MAIN MODULE

(MENU)



APPENDIX E

THE SOURCE CODE

```
/*********************************************************************** 0000001
/*              THE SENTINEL BRIGHT COST MODELS PROGRAM                 0000003
/*                      CATHERINE M  COLLECHI                           0000004
/*                          MARCH 1987                                  0000005
/*********************************************************************** 0000007
/*    MODULE    SBCOST                                                  0000010
/*    FUNCTION   TSO CLIST WHICH DISPLAYS MAIN MENU  LOADS APPROPRIATE  0000020
/*               FORTRAN MODULE- CREATE OR ALTER HARDWARE LIST, DELETE   0000030
/*               AND DISPLAY HARDWARE LIST, RUN OASIS, AIR FORCE AND     0000035
/*               TERCOM COST MODELS, PRINT FILE, OR LIST USER'S FILE     0000040
/*               DIRECTORY, AND EXIT                                     0000045
/*********************************************************************** 0000050
                                                                         0000060
MENU  FREE ALL                                                           0000070
CLRSCRN                                                                  0000080
WRITE                                 **MENU OF OPTIONS**                0000090
WRITE                                                                    0000100
WRITE                                                                    0000110
WRITE                                C)REATE HARDWARE LIST               0000120
WRITE                                A)LTER  HARDWARE LIST               0000130
WRITE                                R)EMOVE HARDWARE LIST               0000140
WRITE                                D)ISPLAY HARDWARE LIST              0000150
WRITE                                P)RINT FILE                         0000160
WRITE                                O)ASIS MODEL                        0000170
WRITE                                U)SAF MODEL                         0000180
WRITE                                T)ERCOM MODEL                       0000190
WRITE                                L)IST FILE DIRECTORY                0000200
WRITE                                  E)XIT SYSTEM                      0000210
WRITE                                                                    0000220
WRITE            PLEASE ENTER CORRESPONDING SINGLE-LETTER COMMAND        0000230
/*                                                                      */ 0000240
READ &ANS                                                                0000250
/*                                                                      */ 0000260
IF &ANS = C THEN +                                                       0000270
  DO                                                                     0000280
    CLRSCRN                                                              0000290
    WRITE ENTER NEW FILENAME                                             0000300
    READ &FILENAME                                                       0000310
    ATTRIB ABC RECFM(F B) LRECL(80) BLKSIZE(3200)                        0000320
    ALLOC FI(FTOBF001) DA(&FILENAME) USING(ABC) NEW SPACE(5,2) TRACKS    0000330
    WRITE &FILENAME HAS BEEN CREATED                                     0000340
    CLRSCRN                                                              0000350
    LOAD CREATE FORTLIB                                                  0000360
    GOTO MENU                                                            0000370
  END                                                                    0000380
/*                                                                      */ 0000390
IF &ANS = A THEN +                                                       0000400
  DO                                                                     0000410
    CLRSCRN                                                              0000420
    WRITE ENTER FILENAME                                                 0000430
    READ &FILE                                                           0000440
    ALLOC FI(FTOBF001) DA(&FILE) OLD                                     0000450
    CLRSCRN                                                              0000460
    LOAD ALTER FORTLIB                                                   0000470
    GOTO MENU                                                            0000480
  END                                                                    0000490
IF &ANS = R THEN +                                                       0000500
  DO                                                                     0000510
    WRITE REMOVE WHICH FILE?                                             0000520
    READ &FILE                                                           0000530
    ALLOC FI(FTOBF001) DA(&FILE) OLD DELETE                              0000540
```

```
    FREEALL                                                                    00000550
    GOTO MENU                                                                  00000560
  END                                                                          00000570
IF &ANS = O THEN +                                                             00000580
  DO                                                                           00000590
    WRITE ENTER FILENAME:                                                      00000600
    READ &FILE                                                                 00000610
    ALLOC FI(FT08F001) DA(&FILE) OLD                                           00000620
    CLRSCRN                                                                    00000630
    LOAD DISPLY FORTLIB                                                        00000640
    GOTO MENU                                                                  00000650
  END                                                                          00000660
                                                                               00000670
IF &ANS = P THEN +                                                             00000680
  DO                                                                           00000690
AGAIN: WRITE ENTER FILENAME:                                                   00000700
    READ &FILE                                                                 00000710
    LISTOFF &FILE                                                              00000720
    WRITE PRINT ANOTHER FILE?                                                  00000730
    WRITE   Y)ES OR N)O                                                        00000740
    READ &ANSR                                                                 00000750
    IF &ANSR = Y THEN GOTO AGAIN                                               00000760
    GOTO MENU                                                                  00000770
  END                                                                          00000780
                                                                               00000790
IF &ANS = O THEN +                                                             00000800
  DO                                                                           00000810
    CLRSCRN                                                                    00000820
    WRITE ENTER FILENAME CONTAINING HARDWARE LIST:                             00000830
    READ &FILE                                                                 00000840
    WRITE ENTER SOFTWARE ESTIMATE FILENAME:                                    00000850
    READ &FILE2                                                                00000860
    WRITE WOULD YOU LIKE TO:                                                   00000870
    WRITE          C)REATE A NEW OUTPUT FILE                                   00000880
    WRITE          R)ETRIEVE AN OLD ONE.                                       00000890
    READ &ANS2                                                                 00000900
    ALLOC FI(FT07F001) DA(&FILE) OLD                                           00000910
    ALLOC FI(FT08F001) DA(&FILE2) OLD                                          00000920
    ALLOC FI(FT09F001) DA(OTEXT DATA) OLD                                      00000930
    IF &ANS2 = C THEN +                                                        00000940
      DO                                                                       00000950
        WRITE ENTER NEW OUTPUT FILENAME.                                       00000960
        READ &FILE3                                                            00000970
        ATTRIB XYZ RECFM(F B) LRECL(80) BLKSIZE(3200)                          00000980
        ALLOC FI(FT10F001) DA(&FILE3) USING(XYZ) NEW SPACE(5,2) TRACKS         00000990
        GOTO OK                                                                00001000
      END                                                                      00001010
    WRITE ENTER OUTPUT FILENAME.                                               00001020
    READ &FILE3                                                                00001030
    ALLOC FI(FT10F001) DA(&FILE3) OLD                                          00001040
OK: LOAD OASIS FORTLIB                                                         00001050
    GOTO MENU                                                                  00001060
  END                                                                          00001070
                                                                               00001080
IF &ANS = U THEN +                                                             00001090
  DO                                                                           00001100
    CLRSCRN                                                                    00001110
    WRITE ENTER FILENAME CONTAINING HARDWARE LIST                              00001120
    READ &FILE                                                                 00001130
    WRITE ENTER SOFTWARE ESTIMATE FILENAME                                     00001140
    READ &FILE2                                                                00001150
```

```
    WRITE WOULD YOU LIKE TO:                                                    00001160
    WRITE          C)REATE A NEW OUTPUT FILE                                    00001170
    WRITE          R)ETRIEVE AN OLD ONE                                         00001180
    READ &ANS2                                                                  00001190
    ALLOC FI(FT07F001) DA(&FILE) OLD                                            00001200
    ALLOC FI(FT08F001) DA(&FILE2) OLD                                           00001210
    ALLOC FI(FT09F001) DA(AFTEXT.DATA) OLD                                      00001220
    IF &ANS2 = C THEN +                                                         00001230
      DO                                                                        00001240
        WRITE ENTER NEW OUTPUT FILENAME:                                        00001250
        READ &FILE3                                                             00001260
        ATTRIB XYZ RECFM(F B) LRECL(80) BLKSIZE(3200)                           00001270
        ALLOC FI(FT10F001) DA(&FILE3) USING(XYZ) NEW SPACE(5,2) TRACKS          00001280
        GOTO OKAY                                                               00001290
      END                                                                       00001300
    WRITE ENTER OUTPUT FILENAME:                                                00001310
    READ &FILE3                                                                 00001320
    ALLOC FI(FT10F001) DA(&FILE3) OLD                                           00001330
OKAY: LOAD USAF FORTLIB                                                         00001340
    GOTO MENU                                                                   00001350
  END                                                                           00001360
                                                                                00001370
IF &ANS = T THEN +                                                              00001380
  DO                                                                            00001390
    CLRSCRN                                                                     00001400
    WRITE ENTER FILENAME CONTAINING HARDWARE LIST                               00001410
    READ &FILE                                                                  00001420
    WRITE ENTER SOFTWARE ESTIMATE FILENAME:                                     00001430
    READ &FILE2                                                                 00001440
    WRITE WOULD YOU LIKE TO:                                                    00001450
    WRITE          C)REATE A NEW OUTPUT FILE                                    00001460
    WRITE          R)ETRIEVE AN OLD ONE                                         00001470
    READ &ANS2                                                                  00001480
    ALLOC FI(FT07F001) DA(&FILE) OLD                                            00001490
    ALLOC FI(FT08F001) DA(&FILE2) OLD                                           00001500
    ALLOC FI(FT09F001) DA(TERTXT.DATA) OLD                                      00001510
    IF &ANS2 = C THEN +                                                         00001520
      DO                                                                        00001530
        WRITE ENTER NEW OUTPUT FILENAME:                                        00001540
        READ &FILE3                                                             00001550
        ATTRIB XYZ RECFM(F B) LRECL(80) BLKSIZE(3200)                           00001560
        ALLOC FI(FT10F001) DA(&FILE3) USING(XYZ) NEW SPACE(5,2) TRACKS          00001570
        GOTO OK2                                                                00001580
      END                                                                       00001590
    WRITE ENTER OUTPUT FILENAME:                                                00001600
    READ &FILE3                                                                 00001610
    ALLOC FI(FT10F001) DA(&FILE3) OLD                                           00001620
OK2: LOAD TERCON FORTLIB                                                        00001630
    GOTO MENU                                                                   00001640
  END                                                                           00001650
                                                                                00001660
IF &ANS = L THEN +                                                              00001670
  DO                                                                            00001680
    LISTC                                                                       00001690
    GOTO MENU                                                                   00001700
END                                                                             00001710
IF &ANS = E THEN END                                                            00001720
                                                                                00001730
```

```
C-------------------------------------------------------------------------      00000001
C              THE SENTINEL BRIGHT COST MODELS PROGRAM                          00000003
C                      CATHERINE M  COLECCHI                                    00000005
C                           MARCH 1983                                          00000007
C-------------------------------------------------------------------------      00000010
C                                                                               00000020
C   MODULE : CREATE                                                             00000030
C   FUNCTION : CREATES NEW HARDWARE LIST                                        00000040
C   INPUTS : FILENAME                                                           00000050
C            HARDWARE LIST ENTRIES                                              00000060
C   OUTPUTS : ---                                                               00000070
C   DESCRIPTION : THE MODULE CREATES A NEW FILE IN                              00000080
C                 WHICH TO STORE HARDWARE LIST, PROMPTING                       00000090
C                 USER FOR FILENAME.  PROGRAM THEN                              00000100
C                 GUIDES USER IN CREATING HARDWARE                              00000110
C                 LIST.  FILE IS SAVED AUTOMATICALLY; MAIN MENUS                00000120
C                 ARE AGAIN DISPLAYED                                           00000130
C                                                                               00000140
C-------------------------------------------------------------------------      00000150
      DIMENSION COUNT(80),ID(50,6),UCOST(50),NUM(50),DEV(50),                   00000160
     1          PRO(50),TCOST(50)                                               00000170
      INTEGER*4 ID,NUM,DEV,PRO,BLANK,THOU,MILL,DENOM,DENOM2,DENOM3              00000180
      INTEGER SUM,COUNT                                                         00000190
      REAL*4 UCOST,TCOST,AMOUNT,TEMP,TPCOST,TDCOST,TEMP2,TEMP3                  00000200
      DATA BLANK/'    '/,ON/'1'/,OFF/'0'/,THOU/'K'/,MILL/'M'/                   00000210
C                                                                               00000220
      WRITE(5,21)                                                               00000230
   21 FORMAT(' PLEASE ENTER THE FOLLOWING INFORMATION.',/                       00000250
     1       ' IF HARDWARE LIST IS COMPLETE,',/                                 00000260
     2       ' PRESS ''RETURN'' WHEN PROMPTED FOR ''IDENTIFICATION'' ')         00000270
C                                                                               00000280
      AMOUNT=0.0                                                                00000290
      DENOM=THOU                                                                00000300
      DENOM2=THOU                                                               00000305
      DENOM3=THOU                                                               00000307
C                  /* PROMPT USER FOR HARDWARE LIST */                        00000310
      DO 141 I=1,50                                                             00000320
        SUM=SUM+1                                                               00000330
        COUNT(I)=SUM                                                            00000340
        WRITE(5,31)                                                             00000350
   31   FORMAT(/,' ENTER HARDWARE IDENTIFICATION ')                             00000360
        READ(5,41)(ID(I,J),J=1,6)                                               00000370
   41   FORMAT(6A4)                                                             00000380
        IF(ID(I,1) .EQ. BLANK)GO TO 500                                         00000390
        WRITE(5,51)                                                             00000400
   51   FORMAT(' ENTER UNIT COST IN THOUSANDS ')                                00000410
        READ(5,*)UCOST(I)                                                       00000420
        WRITE(5,61)                                                             00000430
   61   FORMAT(' ENTER TOTAL NUMBER OF UNITS NEEDED ')                          00000440
        READ(5,*)NUM(I)                                                         00000450
        WRITE(5,71)                                                             00000460
   71   FORMAT(' ENTER NUMBER OF DEVELOPMENT UNITS ')                           00000470
        READ(5,*)DEV(I)                                                         00000480
        WRITE(5,81)                                                             00000490
   81   FORMAT(' ENTER NUMBER OF PRODUCTION UNITS ')                            00000500
        READ(5,*)PRO(I)                                                         00000510
        TCOST(I)=(UCOST(I)*NUM(I))                                              00000520
        TEMP2=TEMP2+(UCOST(I)*DEV(I))                                           00000525
        TEMP3=TEMP3+(UCOST(I)*PRO(I))                                           00000527
        TEMP=TEMP+TCOST(I)                                                      00000530
        AMOUNT=TEMP                                                             00000540
```

```
      TDCOST=TEMP2                                                          00000545
      TPCOST=TEMP3                                                          00000547
      IF(TEMP .GE. 1000)AMOUNT=TEMP/1000                                    00000550
      IF(TEMP .GE. 1000)DENOM=MILL                                          00000560
      IF(TEMP2 .GE. 1000)TDCOST=TEMP2/1000                                  00000565
      IF(TEMP2 .GE. 1000)DENOM2=MILL                                        00000566
      IF(TEMP3 .GE. 1000)TPCOST=TEMP3/1000                                  00000567
      IF(TEMP3 .GE. 1000)DENOM3=MILL                                        00000568
      WRITE(5,91)                                                           00000570
   91 FORMAT(T5,'IDENTIFICATION',T22,'UNIT COST',T34,'NO ',                  00000580
     1          T40,'DEVELOPMENT',T54,'PRODUCTION',T67,                    00000590
     2          'TOTAL COST')                                              00000600
      WRITE(5,97)                                                           00000610
   97 FORMAT(T5,'***************',T22,'**** ****',T34,'***',               00000620
     1       T40,'***********',T54,'**********',T67,                       00000630
     2       '***** ****')                                                 00000640
        DO 111 K=1,SUM                                                      00000650
          WRITE(5,101)COUNT(K),(ID(K,J),J=1,6),UCOST(K),NUM(K),DEV(K),      00000660
     1                PRO(K),TCOST(K)                                       00000670
  101     FORMAT(T1,I2,T6,6A4,T23,F6.1,T33,I4,T41,I4,T55,I4,T68,            00000680
     1           F10.1)                                                     00000690
  111   CONTINUE                                                            00000700
          WRITE(5,121)                                                      00000710
  121     FORMAT(T4,'  ------------------------------------------------     00000720
     1           '----------')                                              00000730
          WRITE(5,131)TDCOST,DENOM2,TPCOST,DENOM3,AMOUNT,DENOM              00000740
  131     FORMAT(T8,'TOTALS',T40,F8.1,A2,T54,F8.1,A2,T67,F8.1,A2)           00000750
  141   CONTINUE                                                            00000760
C                                 /* END PROMPT */                         00000770
C                               /* SAVE CHANGES TO FILE */                 00000780
  500 SUM=SUM-1                                                             00000790
      WRITE(8,151)SUM                                                       00000800
  151 FORMAT(I2)                                                            00000810
      WRITE(8,161)                                                          00000820
  161 FORMAT(T5,'IDENTIFICATION',T22,'UNIT COST',T34,'NO.',                 00000830
     1          T40,'DEVELOPMENT',T54,'PRODUCTION',T68,                    00000840
     2          'TOTAL COST')                                              00000850
      WRITE(8,167)                                                          00000855
  167 FORMAT(T5,'***************',T22,'**** ****',T34,'***',               00000856
     1       T40,'***********',T54,'**********',T68,                       00000857
     2       '***** ****')                                                 00000858
      DO 181 I=1,SUM                                                        00000870
        WRITE(8,171)COUNT(I),(ID(I,J),J=1,6),UCOST(I),NUM(I),DEV(I),        00000880
     1              PRO(I),TCOST(I)                                         00000890
  171   FORMAT(T1,I2,T6,6A4,T23,F6.1,T33,I4,T41,I4,T55,I4,T68,              00000900
     1           F10.1)                                                     00000910
  181 CONTINUE                                                              00000920
        WRITE(8,191)                                                        00000925
  191   FORMAT(T4,'  ------------------------------------------------       00000926
     1           '----------')                                              00000927
        WRITE(8,201)TDCOST,DENOM2,TPCOST,DENOM3,AMOUNT,DENOM                00000930
  201   FORMAT(T8,'TOTALS',T40,F8.1,A2,T54,F8.1,A2,T67,F8.1,A2)             00000940
C                                                                           00000950
      WRITE(5,211)                                                          00000960
  211 FORMAT(' YOUR FILE HAS BEEN SAVED ')                                  00000970
C                                                                           00000980
      STOP                                                                  00000990
      END                                                                   00001000
```

```
C-------------------------------------------------------------------------  00000001
C              THE SENTINEL BRIGHT COST MODELS PROGRAM                      00000003
C                      CATHERINE M. COLECCHI                                00000005
C                           MARCH 1983                                      00000007
C-------------------------------------------------------------------------  00000010
C   MODULE : ALTER                                                          00000020
C   FUNCTION : ALTERS HARDWARE LIST                                         00000030
C   INPUTS : RECORD NO., MODIFICATIONS OR ADDITIONS TO FILE                 00000050
C   OUTPUTS :                                                               00000060
C   DESCRIPTION : ALLOWS USER TO MODIFY, DELETE, OR INSERT A RECORD,        00000070
C                 OR ADD A RECORD TO THE END OF A FILE                      00000075
C-------------------------------------------------------------------------  00000080
C                                                                           00000090
      DIMENSION COUNT(80),ID(50,6),UCOST(50),NUM(50),                       00000100
     1          DEV(50),PRO(50),TCOST(50),TITLE(1,20),STAR(1,20),           00000110
     2          LINE(1,19)                                                  00000120
      REAL*4 UCOST,TCOST,TDCOST,TPCOST,AMOUNT,STORE,STORE2,STORE3           00000130
      INTEGER*4 ID,NUM,DEV,PRO,TITLE,STAR,LINE,VAL                          00000140
      INTEGER SUM,COUNT,RECNO,ANS,REPLY,A,D,E,U,P,DELREC,BLANK,PRIOR,       00000150
     1        TEMP,NOREC,ONE,FLAG,NOU,ON,OFF,ADD,PUTREC,DENOM,DENOM2,       00000160
     2        DENOM3,THOU,MILL,NEW,BEFORE,CHNGE                             00000170
      DATA A/'A'/,D/'D'/,E/'E'/,I/'I'/,U/'U'/,N/'N'/,P/'P'/,B/'B'/,         00000180
     1     BLANK/'  '/,ONE/'1'/,ON/'1'/,OFF/'0'/,THOU/'K'/,MILL/'M'/        00000190
C                                                                           00000200
C               /* READ FILE, DISPLAY ON CONSOLE */                         00000210
C                                                                           00000220
      READ(8,1)SUM                                                          00000230
    1 FORMAT(I2)                                                            00000240
      READ(8,5)(TITLE(1,J),J=1,20)                                          00000250
    5 FORMAT(20A4)                                                          00000260
      WRITE(5,5)(TITLE(1,J),J=1,20)                                         00000270
      READ(8,5)(STAR(1,J),J=1,20)                                           00000280
      WRITE(5,5)(STAR(1,J),J=1,20)                                          00000290
      DO 20 K=1,SUM                                                         00000300
        READ(8,10)COUNT(K),(ID(K,J),J=1,6),UCOST(K),                        00000310
     1            NUM(K),DEV(K),PRO(K),TCOST(K)                             00000320
   10   FORMAT(T1,I2,T6,6A4,T23,F6.1,T33,I4,T41,I4,T55,I4,                  00000330
     1         T66,F10.1)                                                   00000340
C                                                                           00000350
        WRITE(5,10)COUNT(K),(ID(K,J),J=1,6),UCOST(K),                       00000360
     1            NUM(K),DEV(K),PRO(K),TCOST(K)                             00000370
   20 CONTINUE                                                              00000380
      READ(8,22)(LINE(1,J),J=1,19)                                          00000390
   22 FORMAT(19A4)                                                          00000400
      WRITE(5,22)(LINE(1,J),J=1,19)                                         00000410
      READ(8,23)TDCOST,DENOM2,TPCOST,DENOM3,AMOUNT,DENOM                    00000420
   23 FORMAT(T40,F8.1,A2,T54,F8.1,A2,T67,F8.1,A2)                           00000430
      WRITE(5,24)TDCOST,DENOM2,TPCOST,DENOM3,AMOUNT,DENOM                   00000440
   24 FORMAT(T8,'TOTALS',T40,F8.1,A2,T54,F8.1,A2,T67,F8.1,A2)               00000450
C                       /* END READ, DISPLAY */                             00000460
      GO TO 1200                                                            00000470
C                                                                           00000480
C                                                                           00000490
 1000 WRITE(5,25)(TITLE(1,J),J=1,20)                                        00000500
   25 FORMAT(//20A4)                                                        00000510
      WRITE(5,26)(STAR(1,J),J=1,20)                                         00000520
   26 FORMAT(20A4)                                                          00000525
      DO 28 K=1,SUM                                                         00000530
        WRITE(5,27)COUNT(K),(ID(K,J),J=1,6),UCOST(K),                       00000540
     1            NUM(K),DEV(K),PRO(K),TCOST(K)                             00000550
   27   FORMAT(T1,I2,T6,6A4,T23,F6.1,T33,I4,T41,I4,T55,I4,                  00000560
```

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     1          T68,F10.1)                                                    00000570
    28   CONTINUE                                                            00000580
      WRITE(5,29)(LINE(1,J),J=1,19)                                         00000590
    29 FORMAT(19A4)                                                         00000600
      WRITE(5,30)TDCOST,DENOM2,TPCOST,DENOM3,AMOUNT,DENOM                   00000610
    30 FORMAT(T8,'TOTALS',T40,F8.1,A2,T54,F8.1,A2,T67,F8.1,A2)              00000620
C                   /* DISPLAY ALTER MENUS */                              00000630
  1200 ADD=OFF                                                              00000640
      FLAG=OFF                                                              00000650
      WRITE(5,35)                                                           00000660
    35 FORMAT(/' WOULD YOU LIKE TO ',//                                     00000670
     1        '   M)ODIFY A RECORD',/                                       00000680
     2        '   D)ELETE A RECORD',/                                       00000690
     3        '   A)DD A RECORD',/                                          00000700
     4        '   I)NSERT A RECORD',/                                       00000710
     5        '     E)XIT')                                                 00000720
C                                                                           00000730
      READ(5,40)ANS                                                         00000740
    40 FORMAT(A2)                                                           00000750
C                                                                           00000760
      IF(ANS .EQ. A)GO TO 7000                                              00000770
      IF(ANS .EQ. D)GO TO 8000                                              00000780
      IF(ANS .EQ. I)GO TO 9000                                              00000790
      IF(ANS .EQ. E)GO TO 9500                                              00000800
C                                                                           00000810
C                 /** MODIFY A RECORD **/                                   00000820
C                                                                           00000830
      STORE=0.0                                                             00000840
      WRITE(5,50)                                                           00000850
    50 FORMAT(' WHICH RECORD WOULD YOU LIKE TO MODIFY?')                    00000860
      READ(5,*)RECNO                                                        00000870
C                                                                           00000880
      K=RECNO                                                               00000890
C                                                                           00000900
    80 WRITE(5,85)(TITLE(1,J),J=1,20)                                       00000910
    85 FORMAT(20A4)                                                         00000920
      WRITE(5,85)(STAR(1,J),J=1,20)                                         00000930
      WRITE(5,90)COUNT(K),(ID(K,J),J=1,6),UCOST(K),                         00000940
     1           NUM(K),DEV(K),PRO(K),TCOST(K)                            00000950
    90 FORMAT(T1,I2,T6,6A4,T23,F6.1,T33,I4,T41,I4,T55,I4,                   00000960
     1       T68,F10.1)                                                    00000970
C                                                                           00000980
      WRITE(5,100)                                                          00000990
   100 FORMAT(//' MODIFY I)DENTIFICATION, U)NIT COST, N)O. OF UNITS,'/      00001000
     1        '          D)EVELOPMENT, P)RODUCTION, T)OTAL COST, E)XIT?')   00001010
C                                                                           00001020
      READ(5,110)REPLY                                                      00001030
   110 FORMAT(A2)                                                           00001040
C                                                                           00001050
      IF(REPLY .EQ. I)GO TO 2000                                            00001060
      IF(REPLY .EQ. U)GO TO 3000                                            00001070
      IF(REPLY .EQ. N)GO TO 4000                                            00001080
      IF(REPLY .EQ. D)GO TO 5000                                            00001090
      IF(REPLY .EQ. P)GO TO 5500                                            00001100
      IF(REPLY .EQ. E)GO TO 1200                                            00001110
C                                                                           00001120
      WRITE(5,120)                                                          00001130
   120 FORMAT(/' ENTER TOTAL COST IN THOUSANDS.')                           00001140
      READ(5,*)TCOST(K)                                                     00001150
      GO TO 6100                                                            00001160
C                                                                           00001170
```

```
 2000 WRITE(5,140)                                                      00001180
  140 FORMAT(/' ENTER HARDWARE IDENTIFICATION ')                        00001190
      READ(5,150)(ID(K,J),J=1,6)                                        00001200
  150 FORMAT(6A4)                                                       00001210
      GO TO 6000                                                        00001220
C                                                                       00001230
 3000 WRITE(5,160)                                                      00001240
  160 FORMAT(/' ENTER UNIT COST IN THOUSANDS ')                         00001250
      READ(5,*)UCOST(K)                                                 00001260
      GO TO 6000                                                        00001270
C                                                                       00001280
 4000 WRITE(5,180)                                                      00001290
  180 FORMAT(/' ENTER TOTAL NUMBER OF UNITS NEEDED ')                   00001300
      READ(5,*)NUM(K)                                                   00001310
      WRITE(5,181)                                                      00001320
  181 FORMAT(/' REENTER D)EVELOPMENT, P)RODUCTION UNITS.'/               00001330
     1       '          B)OTH OR N)EITHER?')                           00001340
      READ(5,182)CHNGE                                                  00001350
  182 FORMAT(A2)                                                        00001360
      WRITE(5,186)CHNGE                                                 00001365
  186 FORMAT('CHNGE=',A2)                                               00001367
      IF(CHNGE .EQ. B)GO TO 4100                                        00001370
      IF(CHNGE .EQ. D)GO TO 4200                                        00001380
      IF(CHNGE .EQ. P)GO TO 4300                                        00001390
      GO TO 6000                                                        00001400
C                                                                       00001410
 4100 NOU=ON                                                            00001412
 4200 WRITE(5,183)                                                      00001420
  183 FORMAT(/ 'REENTER NUMBER OF DEVELOPMENT UNITS ')                  00001430
      READ(5,*)DEV(K)                                                   00001440
      IF(NOU .EQ. ON)GO TO 4300                                         00001445
      GO TO 6000                                                        00001450
C                                                                       00001460
 4300 WRITE(5,184)                                                      00001462
  184 FORMAT(/' REENTER NUMBER OF PRODUCTION UNITS ')                   00001463
      READ(5,*)PRO(K)                                                   00001464
      GO TO 6000                                                        00001465
C                                                                       00001467
 5000 WRITE(5,200)                                                      00001470
  200 FORMAT(/' ENTER NUMBER OF DEVELOPMENT UNITS ')                    00001480
      BEFORE=DEV(K)                                                     00001490
      READ(5,*)DEV(K)                                                   00001500
      VAL=DEV(K)+PRO(K)                                                 00001505
      IF(VAL .EQ. NUM(K))GO TO 5200                                     00001507
      NEW=(DEV(K)-BEFORE)                                               00001510
      NUM(K)=NUM(K)+NEW                                                 00001520
 5200 GO TO 6000                                                        00001530
C                                                                       00001540
 5500 WRITE(5,210)                                                      00001550
  210 FORMAT(/' ENTER NUMBER OF PRODUCTION UNITS ')                     00001560
      BEFORE=PRO(K)                                                     00001570
      READ(5,*)PRO(K)                                                   00001580
      VAL=PRO(K)+DEV(K)                                                 00001585
      IF(VAL .EQ. NUM(K))GO TO 6000                                     00001587
      NEW=(PRO(K)-BEFORE)                                               00001590
      NUM(K)=NUM(K)+NEW                                                 00001600
C                                                                       00001610
 6000 NOU=OFF                                                           00001615
      TCOST(K)=(UCOST(K)*NUM(K))                                        00001620
C                                                                       00001630
 6100 WRITE(5,220)RECNO                                                 00001640
```

```
  220 FORMAT(/' RECORD NO ', I2,'  NOW LOOKS LIKE THIS ')                00001650
      WRITE(5,221)(TITLE(1,J),J=1,20)                                    00001660
      WRITE(5,221)(STAR(1,J),J=1,20)                                     00001670
  221 FORMAT(20A4)                                                       00001680
      WRITE(5,230)COUNT(K),(ID(K,J),J=1,6),UCOST(K),                     00001690
     1            NUM(K),DEV(K),PRO(K),TCOST(K)                         00001700
C                                                                        00001710
C                    /** END MODIFY **/                                 00001720
C                                                                        00001730
C                   /* SAVE CHANGES TO FILE */                          00001740
 6500 REWIND 8                                                           00001750
      STORE=0.0                                                          00001760
      STORE2=0.0                                                         00001770
      STORE3=0.0                                                         00001780
      DENOM=THOU                                                         00001790
      DENOM2=THOU                                                        00001800
      DENOM3=THOU                                                        00001810
      IF(FLAG .EQ. ON)SUM=SUM-1                                          00001820
      WRITE(8,222)SUM                                                    00001830
  222 FORMAT(I2)                                                         00001840
      WRITE(8,225)(TITLE(1,J),J=1,20)                                    00001850
      WRITE(8,225)(STAR(1,J),J=1,20)                                     00001860
  225 FORMAT(20A4)                                                       00001870
      DO 240 K=1,SUM                                                     00001880
        STORE=STORE+TCOST(K)                                             00001890
        STORE2=STORE2+(UCOST(K)*DEV(K))                                  00001900
        STORE3=STORE3+(UCOST(K)*PRO(K))                                  00001910
        AMOUNT=STORE                                                     00001920
        TDCOST=STORE2                                                    00001930
        TPCOST=STORE3                                                    00001940
        IF(STORE .GE. 1000)AMOUNT=STORE/1000                             00001950
        IF(STORE .GE. 1000)DENOM=MILL                                    00001960
        IF(STORE2 .GE. 1000)TDCOST=STORE2/1000                           00001970
        IF(STORE2 .GE. 1000)DENOM2=MILL                                  00001980
        IF(STORE3 .GE. 1000)TPCOST=STORE3/1000                           00001990
        IF(STORE3 .GE. 1000)DENOM3=MILL                                  00002000
        WRITE(8,230)COUNT(K),(ID(K,J),J=1,6),UCOST(K),                   00002010
     1              NUM(K),DEV(K),PRO(K),TCOST(K)                       00002020
  230 FORMAT(T1,I2,T6,6A4,T23,F6.1,T33,I4,T41,I4,T55,I4,                 00002030
     1       T68,F10.1)                                                  00002040
  240 CONTINUE                                                           00002050
      WRITE(8,225)(LINE(1,J),J=1,19)                                     00002060
      WRITE(8,245)TDCOST,DENOM2,TPCOST,DENOM3,AMOUNT,DENOM               00002070
  245 FORMAT(T8,'TOTALS',T40,F8.1,A2,T54,F8.1,A2,T67,F8.1,A2)            00002080
C                  /* END SAVE */                                       00002090
      IF(ADD .EQ. ON)GO TO 7200                                          00002100
      GO TO 1000                                                         00002110
C                                                                        00002120
C                 /** ADD RECORD TO FILE **/                           00002130
C                                                                        00002140
 7000 WRITE (5,250)                                                      00002150
  250 FORMAT(' ONCE RECORD(S) ARE ADDED PRESS ''RETURN''',/              00002160
     1       ' WHEN PROMPTED FOR ''IDENTIFICATION''')                    00002170
C                                                                        00002180
      ADD=ON                                                             00002190
      FLAG=ON                                                            00002200
      NOREC=SUM+1                                                        00002210
      DO 390 K=NOREC,50                                                  00002220
        SUM=SUM+1                                                        00002230
        COUNT(K)=SUM                                                     00002240
        WRITE(5,260)                                                     00002250
```

```
  260   FORMAT(/' ENTER HARDWARE IDENTIFICATION ')                        00002260
        READ(5,270)(ID(K,J),J=1,6)                                        00002270
  270   FORMAT(6A4)                                                       00002280
        IF(ID(K,1) .EQ. BLANK)GO TO 6500                                  00002290
        WRITE(5,280)                                                      00002300
  280   FORMAT(' ENTER UNIT COST IN THOUSANDS ')                          00002310
        READ(5,*)UCOST(K)                                                 00002320
        WRITE(5,300)                                                      00002330
  300   FORMAT(' ENTER TOTAL NUMBER OF UNITS NEEDED ')                    00002340
        READ(5,*)NUM(K)                                                   00002350
        WRITE(5,320)                                                      00002360
  320   FORMAT(' ENTER NUMBER OF DEVELOPMENT UNITS ')                     00002370
        READ(5,*)DEV(K)                                                   00002380
        WRITE(5,330)                                                      00002390
  330   FORMAT(' ENTER NUMBER OF PRODUCTION UNITS ')                      00002400
        READ(5,*)PRO(K)                                                   00002410
        TCOST(K)=(UCOST(K)*NUM(K))                                        00002420
C                                                                         00002430
C                 /* DISPLAY CHANGES ON TERMINAL */                       00002440
C                                                                         00002450
        STORE=0.0                                                         00002460
        STORE2=0.0                                                        00002470
        STORE3=0.0                                                        00002480
        WRITE(5,360)(TITLE(1,J),J=1,20)                                   00002490
        WRITE(5,360)(STAR(1,J),J=1,20)                                    00002500
  360   FORMAT(20A4)                                                      00002510
          DO 380 L=1,SUM                                                  00002520
            WRITE(5,370)COUNT(L),(ID(L,J),J=1,6),UCOST(L),                00002530
     1                 NUM(L),DEV(L),PRO(L),TCOST(L)                     00002540
  370         FORMAT(T1,I2,T6,6A4,T23,F6.1,T33,I4,T41,I4,T55,I4,          00002550
     1                T68,F10.1)                                          00002560
          STORE=STORE+TCOST(L)                                            00002570
          STORE2=STORE2+(UCOST(L)*DEV(L))                                 00002580
          STORE3=STORE3+(UCOST(L)*PRO(L))                                 00002590
          AMOUNT=STORE                                                    00002600
          TDCOST=STORE2                                                   00002610
          TPCOST=STORE3                                                   00002620
          IF(STORE .GE. 1000)AMOUNT=STORE/1000                            00002630
          IF(STORE .GE. 1000)DENOM=MILL                                   00002640
          IF(STORE2 .GE. 1000)TDCOST=STORE2/1000                          00002650
          IF(STORE2 .GE. 1000)DENOM2=MILL                                 00002660
          IF(STORE3 .GE. 1000)TPCOST=STORE3/1000                          00002670
          IF(STORE3 .GE. 1000)DENOM3=MILL                                 00002680
  380     CONTINUE                                                        00002690
          WRITE(5,385)(LINE(1,J),J=1,19)                                  00002700
  385     FORMAT(19A4)                                                    00002710
          WRITE(5,387)TDCOST,DENOM2,TPCOST,DENOM3,AMOUNT,DENOM            00002720
  387     FORMAT(T8,'TOTAL',T40,F8.1,A2,T54,F8.1,A2,T67,F8.1,A2)          00002730
  390   CONTINUE                                                          00002740
C                                                                         00002750
C                 /** END ADD RECORD **/                                  00002760
C                                                                         00002770
C                 /* DISPLAY ALTER MENUS */                               00002780
        GO TO 1000                                                        00002790
C                                                                         00002800
C                /** DELETE A RECORD FROM FILE **/                       00002810
C                                                                         00002820
 8000 FLAG=OFF                                                            00002830
        WRITE(5,410)                                                      00002840
  410 FORMAT(' WHICH RECORD WOULD YOU LIKE TO DELETE?')                   00002850
      READ(5,*)DELREC                                                     00002860
```

```
      LAST=SUM                                                          00002870
      SUM=SUM-1                                                         00002880
      IF(DELREC .EQ. ONE) GO TO 8500                                    00002890
      IF(DELREC .EQ. LAST)GO TO 6500                                    00002900
C             **CHANGE ALL RECORDS AFTER DELREC**                       00002910
      DO 500 K=DELREC,SUM                                               00002920
        TEMP=K+1                                                        00002930
        COUNT(K)=K                                                      00002940
        DO 480 J=1,6                                                    00002950
          ID(K,J)=ID(TEMP,J)                                            00002960
  480   CONTINUE                                                        00002970
        UCOST(K)=UCOST(TEMP)                                            00002980
        NUM(K)=NUM(TEMP)                                                00002990
        DEV(K)=DEV(TEMP)                                                00003000
        PRO(K)=PRO(TEMP)                                                00003010
        TCOST(K)=TCOST(TEMP)                                            00003020
C                                                                       00003030
  500 CONTINUE                                                          00003040
C             /* SAVE CHANGES TO FILE */                                00003050
      GO TO 6500                                                        00003060
C             /* DO IF 1ST RECORD IS DELETED */                         00003070
 8500 DO 540 K=1,SUM                                                    00003080
        TEMP=K+1                                                        00003090
        COUNT(K)=K                                                      00003100
        DO 510 J=1,6                                                    00003110
          ID(K,J)=ID(TEMP,J)                                            00003120
  510   CONTINUE                                                        00003130
        UCOST(K)=UCOST(TEMP)                                            00003140
        NUM(K)=NUM(TEMP)                                                00003150
        DEV(K)=DEV(TEMP)                                                00003160
        PRO(K)=PRO(TEMP)                                                00003170
        TCOST(K)=TCOST(TEMP)                                            00003180
  540 CONTINUE                                                          00003190
C                       /* SAVE CHANGES TO FILE */                      00003200
      GO TO 6500                                                        00003210
C                                                                       00003220
C                     /** INSERT A RECORD **/                           00003230
C                                                                       00003240
 9000 WRITE(5,550)                                                      00003250
  550 FORMAT(' AFTER WHICH RECORD WOULD YOU LIKE TO INSERT A RECORD? ') 00003260
      READ(5,*)INREC                                                    00003270
C                   /* INITIALIZE DO VARIABLE,SUBSCRIPTS */           00003280
      NREC=INREC+1                                                      00003290
      NXTREC=SUM                                                        00003300
      PUTREC=SUM+1                                                      00003310
C                   /* SHIFT ARRAY ELEMENTS TO ACCOMMODATE INSERT */  00003320
      DO 600 K=NREC,SUM                                                 00003330
        COUNT(K)=K                                                      00003340
        DO 570 J=1,6                                                    00003350
          ID(PUTREC,J)=ID(NXTREC,J)                                     00003360
  570   CONTINUE                                                        00003370
        UCOST(PUTREC)=UCOST(NXTREC)                                     00003380
        NUM(PUTREC)=NUM(NXTREC)                                         00003390
        DEV(PUTREC)=DEV(NXTREC)                                         00003400
        PRO(PUTREC)=PRO(NXTREC)                                         00003410
        TCOST(PUTREC)=TCOST(NXTREC)                                     00003420
C                                                                       00003430
        PUTREC=PUTREC-1                                                 00003440
        NXTREC=NXTREC-1                                                 00003450
  600 CONTINUE                                                          00003460
```

```
C                                                                       00003480
      WRITE(5,610)                                                      00003490
  610 FORMAT(' ENTER HARDWARE IDENTIFICATION ')                         00003500
      READ(5,620)(ID(NREC,J),J=1,6)                                     00003510
  620 FORMAT(6A4)                                                       00003520
C                                                                       00003530
      WRITE(5,630)                                                      00003540
  630 FORMAT(' ENTER UNIT COST IN THOUSANDS ')                          00003550
      READ(5,*)UCOST(NREC)                                              00003560
C                                                                       00003570
      WRITE(5,650)                                                      00003580
  650 FORMAT(' ENTER TOTAL NUMBER OF UNITS NEEDED ')                    00003590
      READ(5,*)NUM(NREC)                                                00003600
C                                                                       00003610
      WRITE(5,670)                                                      00003620
  670 FORMAT(' ENTER NUMBER OF DEVELOPMENT UNITS ')                     00003630
      READ(5,*)DEV(NREC)                                                00003640
C                                                                       00003650
      WRITE(5,690)                                                      00003660
  690 FORMAT(' ENTER NUMBER OF PRODUCTION UNITS ')                      00003670
      READ(5,*)PRO(NREC)                                                00003680
      TCOST(NREC)=(UCOST(NREC)*NUM(NREC))                               00003690
C                                                                       00003700
C                                                                       00003710
      SUM=SUM+1                                                         00003720
      COUNT(SUM)=SUM                                                    00003730
C                        /* SAVE CHANGES TO FILE */                     00003740
      GO TO 8500                                                        00003750
C                                                                       00003760
 9500 STOP                                                              00003770
      END                                                               00003780
```

```
C-------------------------------------------------------------------- 00000001
C                THE SENTINEL BRIGHT COST MODELS PROGRAM             00000005
C                        CATHERINE M  COLECCHI                       00000007
C                             MARCH 1983                             00000008
C-------------------------------------------------------------------- 00000010
C     MODULE   DISPLY                                                00000020
C     FUNCTION   DISPLAYS CONTENTS OF SPECIFIED FILE                 00000030
C                ON CONSOLE                                          00000040
C     INPUTS   FILE NAME                                             00000050
C     OUTPUTS  FILE CONTENTS                                         00000060
C-------------------------------------------------------------------- 00000070
      DIMENSION COUNT(80),ID(50,6),UCOST(50),NUM(50),                00000080
     1          DEV(50),PRO(50),TCOST(50),TITLE(1,19),STAR(1,19),    00000090
     2          LINE(1,19)                                           00000100
      REAL*4 UCOST,DEV,PRO,TCOST,AMOUNT                              00000110
      INTEGER*4 ID,NUM,TITLE,DENOM                                   00000120
      INTEGER SUM,COUNT,E,D,ANS2                                     00000130
      DATA E/'E'/,D/'D'/                                             00000135
C               /* READ FILE FROM DISK, DISPLAY ON CONSOLE */        00000140
 1000 READ(8,10)SUM                                                  00000150
   10 FORMAT(I2)                                                     00000160
      READ(8,20)(TITLE(1,J),J=1,19)                                  00000170
      READ(8,20)(STAR(1,J),J=1,19)                                   00000180
   20 FORMAT(20A4)                                                   00000190
      WRITE(5,20)(TITLE(1,J),J=1,19),(STAR(1,J),J=1,19)              00000200
      DO 50 K=1,SUM                                                  00000210
        READ(8,40)COUNT(K),(ID(K,J),J=1,6),UCOST(K),                 00000220
     1            NUM(K),DEV(K),PRO(K),TCOST(K)                      00000230
   40   FORMAT(T1,I2,T6,6A4,T23,F6.1,T33,I4,T41,I4,T55,I4,           00000240
     1          T68,F10.1)                                           00000250
        WRITE(5,40)COUNT(K),(ID(K,J),J=1,6),UCOST(K),                00000260
     1            NUM(K),DEV(K),PRO(K),TCOST(K)                      00000270
   50 CONTINUE                                                       00000280
      READ(8,20)(LINE(1,J),J=1,19)                                   00000290
      WRITE(5,20)(LINE(1,J),J=1,19)                                  00000300
      READ(8,60)TDCOST,DENOM2,TPCOST,DENOM3,AMOUNT,DENOM             00000310
   60 FORMAT(T40,F8.1,A2,T54,F8.1,A2,T67,F8.1,A2)                    00000320
      WRITE(5,70)TDCOST,DENOM2,TPCOST,DENOM3,AMOUNT,DENOM            00000330
   70 FORMAT(T8,'TOTALS',T40,F8.1,A2,T54,F8.1,A2,T67,F8.1,A2)        00000340
      WRITE(5,80)                                                    00000350
   80 FORMAT( //'E)XIT OR D)ISPLAY AGAIN?')                          00000360
      READ(5,90)ANS2                                                 00000370
   90 FORMAT(A2)                                                     00000380
      IF(ANS2 .EQ. D)REWIND 8                                        00000390
      IF(ANS2 .EQ. D)GO TO 1000                                      00000395
      STOP                                                           00000400
      END                                                            00000410
```

```
C-------------------------------------------------------------------    00000001
C            THE SENTINEL BRIGHT COST MODELS PROGRAM                    00000003
C                 CATHERINE M  COLECCHI                                 00000005
C                      MARCH 1983                                       00000007
C-------------------------------------------------------------------    00000010
C   MODULE  : OASIS                                                     00000020
C   FUNCTION : RUNS OASIS COST MODEL FOR SPECIFIC HARDWARE              00000030
C              CONFIGURATION AND SOFTWARE ESTIMATE                      00000040
C   INPUTS : TOTAL HARDWARE DEVELOPMENT AND PRODUCTION COSTS.           00000050
C            SOFTWARE ESTIMATES                                         00000060
C   OUTPUTS : COST CALCULATION RESULTS TO SPECIFIED                     00000065
C             OUTPUT FILE                                               00000067
C-------------------------------------------------------------------    00000080
      DIMENSION TITLE(1,23),NO(25),STEP(25,23),DATE(1,5)                00000090
      COMMON FLAG,EST,DEVCST,PROCST,DENOM2,DENOM3                       00000100
      INTEGER NO,STEP,SUM,DENOM2,DENOM3,THOU,MILL,FLAG,ON,OFF,CASE,     00000110
     1        DATE                                                       00000120
      REAL*4 DEVCST,PROCST,EST,DCOST                                    00000130
      DATA THOU/'K'/,MILL/'M'/,ON/'1'/,OFF/'0'/                         00000140
      FLAG=OFF                                                          00000150
      CASE=0                                                            00000160
C                          /* GET OASIS MODEL */                      00000170
      READ(9,10)SUM                                                     00000180
   10 FORMAT(I2)                                                        00000190
      READ(9,20)(TITLE(1,J),J=1,23)                                     00000200
   20 FORMAT(23A3)                                                      00000210
      WRITE(5,20)(TITLE(1,J),J=1,23)                                    00000220
      DO 40 I=1,SUM                                                     00000230
        READ(9,30)(STEP(I,J),J=1,23)                                    00000240
   30   FORMAT(23A3)                                                    00000250
        WRITE(5,30)(STEP(I,J),J=1,23)                                   00000260
   40 CONTINUE                                                          00000270
C             /* GET SOFTWARE ESTIMATE */                               00000280
 1000 CALL SWEST                                                        00000290
      CASE=CASE+1                                                       00000300
      IF(FLAG .EQ. ON)GO TO 2000                                        00000310
      IF(CASE .GT. 1)GO TO 1200                                         00000320
      WRITE(5,45)                                                       00000330
   45 FORMAT(/' ENTER TODAY''S DATE ')                                  00000340
      READ(5,47)(DATE(1,J),J=1,5)                                       00000350
   47 FORMAT(5A4)                                                       00000360
      WRITE(5,48)(DATE(1,J),J=1,5),CASE                                 00000365
      WRITE(10,48)(DATE(1,J),J=1,5),CASE                                00000370
   48 FORMAT(//T30,5A4,///T3,'CASE',I3,'  **************************',  00000380
     1                    '**************************')                00000381
      GO TO 1250                                                        00000382
 1200 WRITE(10,49)CASE                                                  00000385
      WRITE(5,49)CASE                                                   00000386
   49 FORMAT(//T3,'CASE',I3,'  ************************************',   00000387
     1                    '****************')                          00000388
 1250 WRITE(5,50)EST,MILL                                               00000390
      WRITE(10,50)EST,MILL                                              00000400
   50 FORMAT(//T16,'THE SOFTWARE ESTIMATE IS ',F6.2,A2)                 00000410
C             /* GET HARDWARE TOTALS */                                 00000420
      CALL GETHW                                                        00000430
      REWIND 7                                                          00000440
      WRITE(5,60)DEVCST,DENOM2,PROCST,DENOM3                            00000450
      WRITE(10,60)DEVCST,DENOM2,PROCST,DENOM3                           00000460
   60 FORMAT(T16,'THE HARDWARE DEVELOPMENT COSTS ARE ',F8.1,A2,/        00000470
     1       T16,'THE HARDWARE PRODUCTION COSTS ARE ',F8.1,A2)          00000480
C            /* CALCULATE OASIS COST */                                00000490
```

```
      IF(DENOM2 .EQ. THOU)DEVCST=DEVCST/1000.                          00000500
      IF(DENOM2 .EQ. THOU)DENOM2=MILL                                  00000510
      IF(DENOM3 .EQ. THOU)PROCST=PROCST/1000.                          00000520
      IF(DENOM3 .EQ. THOU)DENOM3=MILL                                  00000530
C                                                                      00000540
      OCOST=(DEVCST**5.13)*(PROCST**2.85)*EST                          00000550
C                                                                      00000560
      WRITE(5,70)OCOST,DENOM2                                          00000570
      WRITE(10,70)OCOST,DENOM2                                         00000580
   70 FORMAT(/T14,'**THE OASIS MODEL COST ESTIMATE IS ',F8.1,A2)       00000590
      REWIND 8                                                         00000600
      GO TO 1000                                                       00000610
 2000 STOP                                                             00000620
      END                                                              00000630
C---------------------------------------------------------------------- 00000640
C   SUBROUTINE : SWEST                                                 00000650
C   FUNCTION : ALLOWS USER TO SAVE VARIOUS SOFTWARE ESTIMATES          00000660
C              AND SELECT THE APPROPRIATE ESTIMATE FOR A               00000670
C              COST MODEL RUN.                                         00000680
C   INPUTS : SOFTWARE ESTIMATES                                        00000690
C   OUTPUTS :                                                          00000700
C   DESCRIPTION :                                                      00000710
C---------------------------------------------------------------------- 00000720
      SUBROUTINE SWEST                                                 00000730
      DIMENSION COUNT(50),VALUE(50),COMENT(50,6),DATE(50,3),TITLE(1,19),00000740
     1          LINE(2,19)                                             00000750
      COMMON FLAG,EST                                                  00000760
      REAL*4 VALUE,EST                                                 00000770
      INTEGER*4 COMENT,DATE,SUM,COUNT,TITLE,ANS,INPUT,A,R,E,C,FLAG,ON, 00000780
     1          OFF,LINE                                               00000790
      DATA A/'A'/,C/'C'/,R/'R'/,E/'E'/,ON/'1'/,OFF/'0'/                00000800
C                                                                      00000810
      READ(8,2)SUM                                                     00000820
    2 FORMAT(I2)                                                       00000830
      READ(8,4)(TITLE(1,J),J=1,19)                                     00000840
    4 FORMAT(19A4)                                                     00000850
      WRITE(5,6)(TITLE(1,J),J=1,19)                                    00000860
    6 FORMAT(/19A4)                                                    00000870
      DO 14 I=1,2                                                      00000880
        READ(8,12)(LINE(I,J),J=1,19)                                   00000890
   12   FORMAT(19A4)                                                   00000900
        WRITE(5,12)(LINE(I,J),J=1,19)                                  00000910
   14 CONTINUE                                                         00000920
      DO 32 I=1,SUM                                                    00000930
        READ(8,22)COUNT(I),VALUE(I),(COMENT(I,J),J=1,6),               00000940
     1            (DATE(I,J),J=1,3)                                    00000950
   22   FORMAT(T4,I2,T7,F8.2,T21,6A4,T34,3A4)                          00000960
        WRITE(5,22)COUNT(I),VALUE(I),(COMENT(I,J),J=1,6),              00000970
     1             (DATE(I,J),J=1,3)                                   00000980
   32 CONTINUE                                                         00000990
C                                                                      00001000
 1000 WRITE(5,52)                                                      00001010
   52 FORMAT(/'WOULD YOU LIKE TO ',/                                   00001020
     1        '  A)DD A NEW SOFTWARE ESTIMATE',/                       00001030
     2        '  C)HOOSE AN OLD ONE',/                                 00001040
     3        '  R)UN COST MODEL',/                                    00001050
     4        '    E)XIT')                                             00001060
C                                                                      00001070
      READ(5,62)ANS                                                    00001080
   62 FORMAT(A2)                                                       00001090
      IF(ANS .EQ. C)GO TO 2000                                         00001100
```

```
      IF(ANS .EQ. R)GO TO 4000                                          00001110
      IF(ANS .EQ. E)GO TO 3000                                          00001120
C                                                                       00001130
      SUM=SUM+1                                                         00001140
      K=SUM                                                             00001150
      COUNT(K)=K                                                        00001160
      WRITE(5,72)                                                       00001170
   72 FORMAT(' ENTER SOFTWARE ESTIMATE ',/                              00001180
     1       ' (INCLUDE DECIMAL POINT)')                                00001190
      READ(5,82)VALUE(K)                                                00001200
   82 FORMAT(F8.2)                                                      00001210
      WRITE(5,92)                                                       00001220
   92 FORMAT(' ENTER COMMENTS ')                                        00001230
      READ(5,102)(COMENT(K,J),J=1,6)                                    00001240
  102 FORMAT(6A4)                                                       00001250
      WRITE(5,112)                                                      00001260
  112 FORMAT(' ENTER DATE:')                                            00001270
      READ(5,122)(DATE(K,J),J=1,3)                                      00001280
  122 FORMAT(3A4)                                                       00001290
C                                                                       00001300
      REWIND 8                                                          00001310
      WRITE(8,126)SUM                                                   00001320
  126 FORMAT(I2)                                                        00001330
      WRITE(5,128)(TITLE(1,J),J=1,19)                                   00001335
      WRITE(8,128)(TITLE(1,J),J=1,19)                                   00001337
  128 FORMAT(19A4)                                                      00001338
      DO 137 I=1,2                                                      00001340
        WRITE(5,132)(LINE(I,J),J=1,19)                                  00001350
        WRITE(8,132)(LINE(I,J),J=1,19)                                  00001360
  132   FORMAT(19A4)                                                    00001370
  137 CONTINUE                                                          00001380
      DO 152 K=1,SUM                                                    00001390
        WRITE(5,142)COUNT(K),VALUE(K),(COMENT(K,J),J=1,6),              00001400
     1              (DATE(K,J),J=1,3)                                   00001410
        WRITE(8,142)COUNT(K),VALUE(K),(COMENT(K,J),J=1,6),              00001420
     1              (DATE(K,J),J=1,3)                                   00001430
  142   FORMAT(T4,I2,T7,F8.2,T23,6A4,T34,3A4)                           00001440
  152 CONTINUE                                                          00001450
      GO TO 1000                                                        00001460
C                                                                       00001470
 2000 WRITE(5,162)                                                      00001480
  162 FORMAT(' WHICH ESTIMATE?')                                        00001490
      READ(5,*)INPUT                                                    00001500
      I=INPUT                                                           00001510
      EST=VALUE(I)                                                      00001520
      GO TO 1000                                                        00001530
C                                                                       00001540
 3000 FLAG=ON                                                           00001550
 4000 RETURN                                                            00001560
      END                                                               00001570
C                                                                       00001580
C-----------------------------------------------------------------------00001590
C   SUBROUTINE : GETHW                                                  00001600
C   FUNCTION   : RETRIEVES DEVELOPMENT AND PRODUCTION                   00001610
C                HARDWARE TOTALS FOR A PARTICULAR HARDWARE              00001620
C                LIST                                                   00001630
C   INPUTS     : ---                                                    00001640
C   OUTPUTS    : HARDWARE TOTALS                                        00001650
C   DESCRIPTION                                                         00001660
C-----------------------------------------------------------------------00001670
      SUBROUTINE GETHW                                                  00001680
```

```
      DIMENSION TITLE(1,20),STAR(1,20),TEXT(1,20),LINE(1,20)          00001690
      COMMON FLAG,EST,DEVCST,PROCST,DENOM2,DENOM3                     00001700
      INTEGER SUM,TITLE,STAR,LINE,TEXT                                00001710
C                                                                     00001720
      READ(7,4)SUM,TITLE,STAR                                         00001730
    4 FORMAT(I2/20A4/20A4)                                            00001740
      DO 24 I=1,SUM                                                   00001750
        READ(7,14)(TEXT(I,J),J=1,20)                                  00001760
   14   FORMAT(20A4)                                                  00001770
   24 CONTINUE                                                        00001780
      READ(7,34)(LINE(1,J),J=1,20)                                    00001790
   34 FORMAT(20A4)                                                    00001800
      READ(7,44)DEVCST,DENOM2,PROCST,DENOM3                           00001810
   44 FORMAT(T40,F8.1,A2,T54,F8.1,A2)                                 00001820
      RETURN                                                          00001830
      END                                                             00001840
```

```
C-------------------------------------------------------------------- 00000001
C          THE SENTINEL BRIGHT COST MODELS PROGRAM                   00000005
C                  CATHERINE M. COLECCHI                             00000006
C                       MARCH 1983                                   00000007
C-------------------------------------------------------------------- 00000010
C   MODULE : USAF                                                    00000020
C   FUNCTION : RUNS AIR FORCE COST MODEL FOR SPECIFIC HARDWARE       00000030
C              CONFIGURATION AND SOFTWARE ESTIMATE.                  00000040
C   INPUTS : TOTAL HARDWARE DEVELOPMENT AND PRODUCTION COSTS.        00000050
C            SOFTWARE ESTIMATES                                      00000060
C   OUTPUTS : COST CALCULATIONS TO SPECIFIED OUTPUT FILE             00000070
C-------------------------------------------------------------------- 00000080
      DIMENSION TITLE(1,23),NO(25),STEP(25,23),DATE(1,5)             00000090
      COMMON FLAG,EST,DEVCST,PROCST,DENOM2,DENOM3                    00000100
      INTEGER NO,STEP,SUM,DENOM2,DENOM3,THOU,MILL,FLAG,ON,OFF,CASE,  00000110
     !        DATE                                                    00000120
      REAL*4 DEVCST,PROCST,EST,AFCOST,HWCOST                         00000130
      DATA THOU/'K'/,MILL/'M'/,ON/'1'/,OFF/'0'/                      00000140
      FLAG=OFF                                                       00000150
      CASE=0                                                         00000160
C                          /* GET AIR FORCE MODEL */                00000170
      READ(9,10)SUM                                                  00000180
   10 FORMAT(I2)                                                     00000190
      READ(9,20)(TITLE(1,J),J=1,23)                                  00000200
   20 FORMAT(23A3)                                                   00000210
      WRITE(5,20)(TITLE(1,J),J=1,23)                                 00000220
      DO 40 I=1,SUM                                                  00000230
        READ(9,30)(STEP(I,J),J=1,23)                                 00000240
   30   FORMAT(23A3)                                                 00000250
        WRITE(5,30)(STEP(1,J),J=1,23)                                00000260
   40 CONTINUE                                                       00000270
C                 /* GET SOFTWARE ESTIMATE */                       00000280
 1000 CALL SWEST                                                     00000290
      CASE=CASE+1                                                    00000300
      IF(FLAG .EQ. ON)GO TO 2000                                     00000310
      IF(CASE .GT. 1)GO TO 1200                                      00000320
      WRITE(5,45)                                                    00000330
   45 FORMAT(/' ENTER TODAY''S DATE:')                               00000340
      READ(5,47)(DATE(1,J),J=1,5)                                    00000350
   47 FORMAT(5A4)                                                    00000360
      WRITE(5,48)(DATE(1,J),J=1,5),CASE                              00000370
      WRITE(10,48)(DATE(1,J),J=1,5),CASE                             00000380
   48 FORMAT(///T30,5A4,///T3,'CASE',I3,'  **************************',00000390
     !                          '**************************')        00000395
      GO TO 1250                                                     00000400
 1200 WRITE(5,49)CASE                                                00000410
      WRITE(10,49)CASE                                               00000415
   49 FORMAT(///T3,'CASE',I3,'  ************************************',00000417
     !                        '****************')                   00000418
 1250 WRITE(5,50)EST,MILL                                            00000420
      WRITE(10,50)EST,MILL                                           00000430
   50 FORMAT(///T14,'THE SOFTWARE ESTIMATE IS ',F6.2,A2)             00000440
C                  /* GET HARDWARE TOTALS */                        00000450
      CALL GETHW                                                     00000460
      REWIND 7                                                       00000470
C            /* CALCULATE AIR FORCE COST */                        00000480
      IF(DENOM2 .EQ. THOU)DEVCST=DEVCST/1000.                        00000490
      IF(DENOM2 .EQ. THOU)DENOM2=MILL                                00000500
      IF(DENOM3 .EQ. THOU)PROCST=PROCST/1000                         00000510
      IF(DENOM3 .EQ. THOU)DENOM3=MILL                                00000520
C                                                                    00000530
```

```
      HWCOST=DEVCST+PROCST                                                    00000540
      AFCOST=(HWCOST*2.61)+(EST*1.20)                                         00000550
C                                                                             00000560
      WRITE(5,62)HWCOST,DENOM3                                                00000570
      WRITE(10,62)HWCOST,DENOM3                                               00000580
   62 FORMAT(T14,'THE TOTAL HARDWARE CONFIGURATION COST IS:',F8.2,A2)         00000590
      WRITE(5,70)AFCOST,DENOM2                                                00000600
      WRITE(10,70)AFCOST,DENOM2                                               00000610
   70 FORMAT(/T9,'**THE AIR FORCE MODEL COST ESTIMATE IS:',F8.1,A2)           00000620
      REWIND 8                                                                00000630
      GO TO 1000                                                              00000640
 2000 STOP                                                                    00000650
      END                                                                     00000660
C-----------------------------------------------------------------------      00000670
C   SUBROUTINE : SWEST                                                        00000680
C   FUNCTION : ALLOWS USER TO SAVE VARIOUS SOFTWARE ESTIMATES                 00000690
C              AND SELECT THE APPROPRIATE ESTIMATE FOR A                      00000700
C              COST MODEL RUN.                                                00000710
C   INPUTS : SOFTWARE ESTIMATES                                               00000720
C   OUTPUTS :                                                                 00000730
C   DESCRIPTION :                                                             00000740
C-----------------------------------------------------------------------      00000750
      SUBROUTINE SWEST                                                        00000760
      DIMENSION COUNT(50),VALUE(50),COMENT(50,6),DATE(50,3),TITLE(1,19),      00000770
     1          LINE(2,19)                                                    00000780
      COMMON FLAG,EST                                                         00000790
      REAL*4 VALUE,EST                                                        00000800
      INTEGER*4 COMENT,DATE,SUM,COUNT,TITLE,ANS,INPUT,A,R,E,C,FLAG,ON,        00000810
     1          OFF,LINE                                                      00000820
      DATA A/'A'/,C/'C'/,R/'R'/,E/'E'/,ON/'1'/,OFF/'0'/                       00000830
C                                                                             00000840
      READ(8,2)SUM                                                            00000850
    2 FORMAT(I2)                                                              00000860
      READ(8,4)(TITLE(1,J),J=1,19)                                            00000870
    4 FORMAT(19A4)                                                            00000880
      WRITE(5,6)(TITLE(1,J),J=1,19)                                           00000890
    6 FORMAT(/19A4)                                                           00000900
      DO 14 I=1,2                                                             00000910
        READ(8,12)(LINE(I,J),J=1,19)                                          00000920
   12   FORMAT(19A4)                                                         00000930
        WRITE(5,12)(LINE(I,J),J=1,19)                                         00000940
   14 CONTINUE                                                                00000950
      DO 32 I=1,SUM                                                           00000960
        READ(8,22)COUNT(I),VALUE(I),(COMENT(I,J),J=1,6),                      00000970
     1          (DATE(I,J),J=1,3)                                           00000980
   22   FORMAT(T4,I2,T7,F8.2,T23,6A4,T34,3A4)                                00000990
        WRITE(5,22)COUNT(I),VALUE(I),(COMENT(I,J),J=1,6),                     00001000
     1          (DATE(I,J),J=1,3)                                           00001010
   32 CONTINUE                                                                00001020
C                                                                             00001030
 1000 WRITE(5,52)                                                             00001040
   52 FORMAT(/'WOULD YOU LIKE TO:',/                                          00001050
     1        '  A)DD A NEW SOFTWARE ESTIMATE',/                             00001060
     2        '  C)HOOSE AN OLD ONE',/                                       00001070
     3        '  R)UN COST MODEL',/                                          00001080
     4        '    E)XIT')                                                   00001090
C                                                                             00001100
      READ(5,62)ANS                                                           00001110
   62 FORMAT(A2)                                                              00001120
      IF(ANS .EQ. C)GO TO 2000                                                00001130
      IF(ANS .EQ. R)GO TO 4000                                                00001140
```

```
      IF(ANS  EQ. E)GO TO 3000                                          00001150
C                                                                       00001160
      SUM=SUM+1                                                         00001170
      K=SUM                                                             00001180
      COUNT(K)=K                                                        00001190
      WRITE(5,72)                                                       00001200
   72 FORMAT(' ENTER SOFTWARE ESTIMATE IN MILLIONS:',/                  00001210
     1       ' (INCLUDE DECIMAL POINT)')                                00001220
      READ(5,82)VALUE(K)                                                00001230
   82 FORMAT(F8.2)                                                      00001240
      WRITE(5,92)                                                       00001250
   92 FORMAT(' ENTER COMMENTS:')                                        00001260
      READ(5,102)(COMENT(K,J),J=1,6)                                    00001270
  102 FORMAT(6A4)                                                       00001280
      WRITE(5,112)                                                      00001290
  112 FORMAT(' ENTER DATE:')                                            00001300
      READ(5,122)(DATE(K,J),J=1,3)                                      00001310
  122 FORMAT(3A4)                                                       00001320
C                                                                       00001330
      REWIND 8                                                          00001340
      WRITE(8,126)SUM                                                   00001350
  126 FORMAT(I2)                                                        00001360
      DO 137 I=1,3                                                      00001370
        WRITE(5,132)(TITLE(I,J),J=1,19)                                 00001380
        WRITE(8,132)(TITLE(I,J),J=1,19)                                 00001390
  132   FORMAT(19A4)                                                    00001400
  137 CONTINUE                                                          00001410
      DO 152 K=1,SUM                                                    00001420
        WRITE(5,142)COUNT(K),VALUE(K),(COMENT(K,J),J=1,6),              00001430
     1              (DATE(K,J),J=1,3)                                   00001440
        WRITE(8,142)COUNT(K),VALUE(K),(COMENT(K,J),J=1,6),              00001450
     1              (DATE(K,J),J=1,3)                                   00001460
  142   FORMAT(T4,I2,T7,F8.2,T23,6A4,T34,3A4)                           00001470
  152 CONTINUE                                                          00001480
      GO TO 1000                                                        00001490
C                                                                       00001500
 2000 WRITE(5,162)                                                      00001510
  162 FORMAT(' WHICH ESTIMATE?')                                        00001520
      READ(5,*)INPUT                                                    00001530
      I=INPUT                                                           00001540
      EST=VALUE(I)                                                      00001550
      GO TO 1000                                                        00001560
C                                                                       00001570
 3000 FLAG=ON                                                           00001580
 4000 RETURN                                                            00001590
      END                                                               00001600
C                                                                       00001610
C-----------------------------------------------------------------------00001620
C   SUBROUTINE : GETHW                                                  00001630
C   FUNCTION   : RETRIEVES DEVELOPMENT AND PRODUCTION                   00001640
C                HARDWARE TOTALS FOR A PARTICULAR HARDWARE              00001650
C                LIST.                                                  00001660
C   INPUTS     :                                                        00001670
C   OUTPUTS    :                                                        00001680
C   DESCRIPTION :                                                       00001690
C-----------------------------------------------------------------------00001700
      SUBROUTINE GETHW                                                  00001710
      DIMENSION TITLE(1,20),STAR(1,20),TEXT(1,20),LINE(1,20)            00001720
      COMMON FLAG,EST,DEVCST,PROCST,DENOM2,DENOM3                       00001730
      INTEGER SUM,TITLE,STAR,LINE,TEXT                                  00001740
                                                                        00001750
```

```
      READ(7,4)SUM,TITLE,STAR                                          00001760
    4 FORMAT(I2/20A4/20A4)                                             00001770
      DO 24 I=1,SUM                                                    00001780
        READ(7,14)(TEXT(I,J),J=1,20)                                   00001790
   14   FORMAT(20A4)                                                   00001800
   24 CONTINUE                                                         00001810
      READ(7,34)(LINE(1,J),J=1,20)                                     00001820
   34 FORMAT(20A4)                                                     00001830
      READ(7,44)DEVCST,DENOM2,PROCST,DENOM3                            00001840
   44 FORMAT(T40,F8.1,A2,T54,F8.1,A2)                                  00001850
      RETURN                                                           00001860
      END                                                              00001870
```

```
C-------------------------------------------------------------------- 00000001
C                THE SENTINEL BRIGHT COST MODELS PROGRAM             00000005
C                      CATHERINE M. COLECCHI                         00000007
C                           MARCH 1983                               00000008
C-------------------------------------------------------------------- 00000010
C   MODULE : TERCON                                                  00000020
C   FUNCTION : RUNS TERCON COST MODEL FOR SPECIFIC HARDWARE          00000030
C              CONFIGURATION AND SOFTWARE ESTIMATE                   00000040
C   INPUTS : TOTAL HARDWARE DEVELOPMENT AND PRODUCTION COSTS,        00000050
C            SOFTWARE ESTIMATES                                      00000060
C   OUTPUTS : COST CALCULATIONS TO SPECIFIED OUTPUT FILE             00000070
C-------------------------------------------------------------------- 00000080
      DIMENSION TITLE(1,23),NO(25),STEP(25,23),DATE(1,5)             00000090
      COMMON FLAG,EST,DEVCST,PROCST,DENOM2,DENOM3                    00000100
      INTEGER NO,STEP,SUM,DENOM2,DENOM3,THOU,MILL,FLAG,ON,OFF,CASE,  00000110
     1        DATE                                                    00000120
      REAL*4 DEVCST,PROCST,EST,TERCST,HWCOST                         00000130
      DATA THOU/'K'/,MILL/'M'/,ON/'1'/,OFF/'0'/                      00000140
      FLAG=OFF                                                       00000150
      CASE=0                                                         00000160
C                          /* GET TERCON MODEL */                   00000170
      READ(9,10)SUM                                                  00000180
   10 FORMAT(I2)                                                     00000190
      READ(9,20)(TITLE(1,J),J=1,23)                                  00000200
   20 FORMAT(23A3)                                                   00000210
      WRITE(5,20)(TITLE(1,J),J=1,23)                                 00000220
      DO 40 I=1,SUM                                                  00000230
        READ(9,30)(STEP(I,J),J=1,23)                                 00000240
   30   FORMAT(23A3)                                                00000250
        WRITE(5,30)(STEP(I,J),J=1,23)                                00000260
   40 CONTINUE                                                       00000270
C                /* GET SOFTWARE ESTIMATE */                       00000280
 1000 CALL SWEST                                                     00000290
      CASE=CASE+1                                                    00000300
      IF(FLAG .EQ. ON)GO TO 2000                                     00000310
      IF(CASE .GT. 1)GO TO 1200                                      00000320
      WRITE(5,45)                                                    00000330
   45 FORMAT(/' ENTER TODAY''S DATE')                                00000340
      READ(5,47)(DATE(1,J),J=1,5)                                    00000350
   47 FORMAT(5A4)                                                    00000355
      WRITE(5,48)(DATE(1,J),J=1,5),CASE                              00000360
      WRITE(10,48)(DATE(1,J),J=1,5),CASE                             00000370
   48 FORMAT(///T30,5A4,///T3,'CASE',I3,'  **************************',00000380
     1                                 '**************************')  00000385
      GO TO 1250                                                     00000390
 1200 WRITE(10,49)CASE                                               00000395
      WRITE(5,49)CASE                                                00000397
   49 FORMAT(//T3,'CASE',I3,'  ********************************',    00000398
     1                        '******************')                 00000399
 1250 WRITE(5,50)EST,MILL                                            00000400
      WRITE(10,50)EST,MILL                                           00000405
   50 FORMAT(//T15,'THE SOFTWARE ESTIMATE IS ',F6.2,A2)              00000410
C                /* GET HARDWARE TOTALS */                         00000420
      CALL GETHW                                                     00000430
      REWIND 7                                                       00000440
C             /* CALCULATE TERCON COST */                           00000450
      IF(DENOM2 .EQ. THOU)DEVCST=DEVCST/1000.                        00000460
      IF(DENOM2 .EQ. THOU)DENOM2=MILL                                00000470
      IF(DENOM3 .EQ. THOU)PROCST=PROCST/1000                         00000480
      IF(DENOM3 .EQ. THOU)DENOM3=MILL                                00000490
                                                                     00000500
```

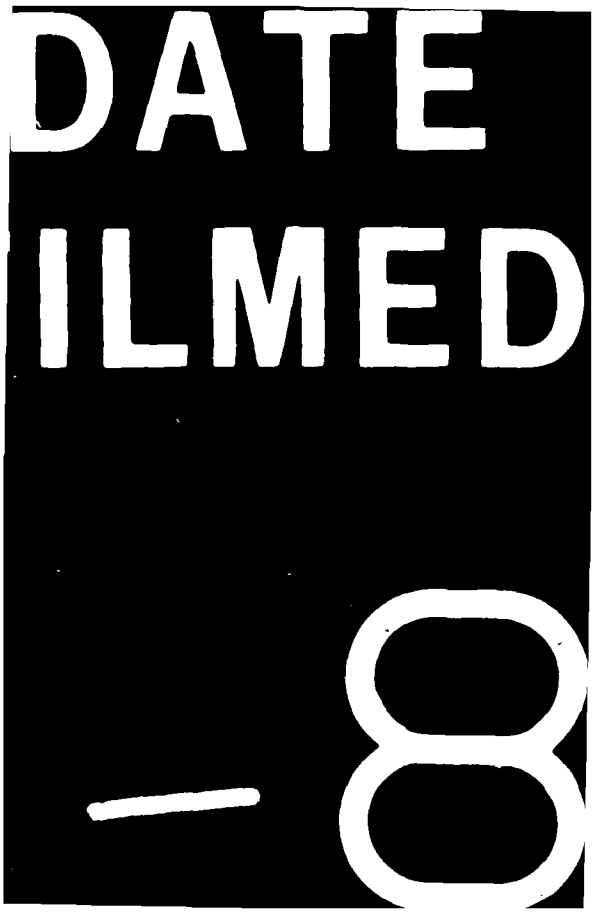
```
      HWCOST=DEVCST+PROCST                                                  00000510
      TERCST=(HWCOST*2.65)+(EST*2.10)                                       00000520
C                                                                           00000530
      WRITE(5,62)HWCOST,DENOM3                                              00000540
      WRITE(10,62)HWCOST,DENOM3                                             00000545
   62 FORMAT(T15,'THE TOTAL HARDWARE CONFIGURATION COST IS:',F8.2,A2)       00000550
      WRITE(5,70)TERCST,DENOM2                                              00000560
      WRITE(10,70)TERCST,DENOM2                                             00000565
   70 FORMAT(//T13,'**THE TERCON MODEL COST ESTIMATE IS:',F8.1,A2)          00000570
      REWIND 8                                                              00000580
      GO TO 1000                                                            00000590
 2000 STOP                                                                  00000600
      END                                                                   00000610
C-------------------------------------------------------------------------  00000620
C   SUBROUTINE : SWEST                                                      00000630
C   FUNCTION : ALLOWS USER TO SAVE VARIOUS SOFTWARE ESTIMATES               00000640
C              AND SELECT THE APPROPRIATE ESTIMATE FOR A                    00000650
C              COST MODEL RUN.                                              00000660
C   INPUTS : SOFTWARE ESTIMATES                                             00000670
C   OUTPUTS :                                                               00000680
C   DESCRIPTION :                                                           00000690
C-------------------------------------------------------------------------  00000700
      SUBROUTINE SWEST                                                      00000710
      DIMENSION COUNT(50),VALUE(50),COMENT(50,6),DATE(50,3),TITLE(1,19),00000720
     1          LINE(2,19)                                                  00000730
      COMMON FLAG,EST                                                       00000740
      REAL*4 VALUE,EST                                                      00000750
      INTEGER*4 COMENT,DATE,SUM,COUNT,TITLE,ANS,INPUT,A,R,E,C,FLAG,ON,  00000760
     1          OFF,LINE                                                    00000770
      DATA A/'A'/,C/'C'/,R/'R'/,E/'E'/,ON/'1'/,OFF/'0'/                     00000780
C                                                                           00000790
      READ(8,2)SUM                                                          00000800
    2 FORMAT(I2)                                                            00000810
      READ(8,4)(TITLE(1,J),J=1,19)                                          00000820
    4 FORMAT(19A4)                                                          00000830
      WRITE(5,6)(TITLE(1,J),J=1,19)                                         00000840
    6 FORMAT(/19A4)                                                         00000850
      DO 14 I=1,2                                                           00000860
        READ(8,12)(LINE(I,J),J=1,19)                                        00000870
   12   FORMAT(19A4)                                                        00000880
        WRITE(5,12)(LINE(I,J),J=1,19)                                       00000890
   14 CONTINUE                                                              00000900
      DO 32 I=1,SUM                                                         00000910
        READ(8,22)COUNT(I),VALUE(I),(COMENT(I,J),J=1,6),                    00000920
     1          (DATE(I,J),J=1,3)                                           00000930
   22   FORMAT(T4,I2,T7,F8.2,T23,6A4,T34,3A4)                               00000940
        WRITE(5,22)COUNT(I),VALUE(I),(COMENT(I,J),J=1,6),                   00000950
     1          (DATE(I,J),J=1,3)                                           00000960
   32 CONTINUE                                                              00000970
C                                                                           00000980
 1000 WRITE(5,52)                                                           00000990
   52 FORMAT(/'WOULD YOU LIKE TO:'/                                         00001000
     1       ' A)DD A NEW SOFTWARE ESTIMATE'/                               00001010
     2       ' C)HOOSE AN OLD ONE'/                                         00001020
     3       ' R)UN COST MODEL'/                                            00001030
     4       '   E)XIT')                                                    00001040
C                                                                           00001050
      READ(5,62)ANS                                                         00001060
   62 FORMAT(A2)                                                            00001070
      IF(ANS .EQ. C)GO TO 2000                                              00001080
      IF(ANS .EQ. R)GO TO 4000                                              00001090
```

```
      IF(ANS .EQ. E)GO TO 3000                                          00001100
C                                                                       00001110
      SUM=SUM+1                                                         00001120
      K=SUM                                                             00001130
      COUNT(K)=K                                                        00001140
      WRITE(5,72)                                                       00001150
   72 FORMAT(' ENTER SOFTWARE ESTIMATE IN MILLIONS '/                   00001160
     1       ' (INCLUDE DECIMAL POINT)')                                00001170
      READ(5,82)VALUE(K)                                                00001180
   82 FORMAT(F8.2)                                                      00001190
      WRITE(5,92)                                                       00001200
   92 FORMAT(' ENTER COMMENTS ')                                        00001210
      READ(5,102)(COMENT(K,J),J=1,6)                                    00001220
  102 FORMAT(6A4)                                                       00001230
      WRITE(5,112)                                                      00001240
  112 FORMAT(' ENTER DATE ')                                            00001250
      READ(5,122)(DATE(K,J),J=1,3)                                      00001260
  122 FORMAT(3A4)                                                       00001270
C                                                                       00001280
      REWIND 8                                                          00001290
      WRITE(8,126)SUM                                                   00001300
  126 FORMAT(I2)                                                        00001310
      DO 137 I=1,3                                                      00001320
        WRITE(5,132)(TITLE(I,J),J=1,19)                                 00001330
        WRITE(8,132)(TITLE(I,J),J=1,19)                                 00001340
  132   FORMAT(19A4)                                                    00001350
  137 CONTINUE                                                          00001360
      DO 152 K=1,SUM                                                    00001370
        WRITE(5,142)COUNT(K),VALUE(K),(COMENT(K,J),J=1,6)               00001380
     1              (DATE(K,J),J=1,3)                                  00001390
        WRITE(8,142)COUNT(K),VALUE(K),(COMENT(K,J),J=1,6),              00001400
     1              (DATE(K,J),J=1,3)                                  00001410
  142   FORMAT(T4,I2,T7,F8.2,T23,6A4,T34,3A4)                           00001420
  152 CONTINUE                                                          00001430
      GO TO 1000                                                        00001440
C                                                                       00001450
 2000 WRITE(5,162)                                                      00001460
  162 FORMAT(' WHICH ESTIMATE?')                                        00001470
      READ(5,*)INPUT                                                    00001480
      I=INPUT                                                           00001490
      EST=VALUE(I)                                                      00001500
      GO TO 1000                                                        00001510
C                                                                       00001520
 3000 FLAG=ON                                                           00001530
 4000 RETURN                                                            00001540
      END                                                               00001550
C                                                                       00001560
C-----------------------------------------------------------------------00001570
C   SUBROUTINE : GETHW                                                  00001580
C   FUNCTION : RETRIEVES DEVELOPMENT AND PRODUCTION                     00001590
C              HARDWARE TOTALS FOR A PARTICULAR HARDWARE                00001600
C              LIST.                                                    00001610
C   INPUTS :                                                            00001620
C   OUTPUTS :                                                           00001630
C   DESCRIPTION :                                                       00001640
C-----------------------------------------------------------------------00001650
      SUBROUTINE GETHW                                                  00001660
      DIMENSION TITLE(1,20),STAR(1,20),TEXT(1,20),LINE(1,20)            00001670
      COMMON FLAG,EST,DEVCST,PRODCST,DENOM2,DENOM3                      00001680
      INTEGER SUM,TITLE,STAR,LINE,TEXT                                  00001690
                                                                        00001700
```

```
      READ(7,4)SUM,TITLE,STAR                                          00001710
    4 FORMAT(I2/20A4/20A4)                                             00001720
      DO 24 I=1,SUM                                                    00001730
        READ(7,14)(TEXT(I,J),J=1,20)                                   00001740
   14   FORMAT(20A4)                                                   00001750
   24 CONTINUE                                                         00001760
      READ(7,34)(LINE(1,J),J=1,20)                                     00001770
   34 FORMAT(20A4)                                                     00001780
      READ(7,44)DEVCST,DENOM2,PROCST,DENOM3                            00001790
   44 FORMAT(T40,F8.1,A2,T54,F8.1,A2)                                  00001800
      RETURN                                                           00001810
      END                                                              00001820
```

```
00 /*****/*************************************************************
0000010/*                THE SENTINEL BRIGHT COST MODELS PROGRAM
0000020/*                        CATHERINE M  COLECCHI
0000030/*                            MARCH 1983
0000040/*************************************************************
0000050/*   MODULE    SWFILE
0000060/*   FUNCTION    CREATES SOFTWARE ESTIMATE FILE IN WHICH TO STORE
0000070/*                VARIOUS SOFTWARE ESTIMATES USED IN COST MODEL
0000080/*                CALCULATIONS
0000085/*   INPUTS    SOFTWARE FILENAME
0000087/*   OUTPUTS
0000088/*************************************************************
0000090FREEALL
0000100WRITE ENTER SOFTWARE FILENAME
0000110READ AFILE
0000120ATTRIB ABC RECFM(F B) LRECL(80) BLKSIZE(3200)
0000130ALLOC FI(FTO8F001) DA(AFILE) USING(ABC) NEW SPACE(5,2) TRACKS
0000140LOAD SOFTWR FORTLIB
0000150FREEALL
0000160END
```

```
C-----------------------------------------------------------------------      00000001
C          THE SENTINEL BRIGHT COST MODELS PROGRAM                            00000005
C                  CATHERINE M. COLECCHI                                      00000007
C                       MARCH 1983                                            00000008
C-----------------------------------------------------------------------      00000010
C   MODULE: SOFTWR                                                           00000020
C   FUNCTION: CREATES FILE IN WHICH TO STORE SOFTWARE ESTIMATES               00000030
C   INPUTS : SOFTWARE ESTIMATES, COMMENTS, DATE                              00000035
C   OUTPUTS : SOFTWARE ESTIMATES, COMMENTS, DATE TO                          00000037
C             SPECIFIED FILE                                                 00000038
C-----------------------------------------------------------------------      00000040
      DIMENSION COUNT(50),VALUE(50),COMENT(50,6),DATE(50,3),TITLE(1,19) 00000050
      REAL*4 VALUE                                                           00000060
      INTEGER*4 COMENT,DATE,SUM,COUNT,TITLE                                  00000070
C                                                                            00000080
      SUM=0                                                                  00000090
      DO 60 I=1,50                                                           00000100
        SUM=SUM+1                                                            00000110
        COUNT(I)=I                                                           00000120
        WRITE(5,10)                                                          00000130
   10   FORMAT(' ENTER SOFTWARE ESTIMATE IN MILLIONS:'/                      00000140
     1         '(INCLUDE DECIMAL POINT)')                                    00000150
        READ(5,15)VALUE(I)                                                   00000160
   15   FORMAT(F8.2)                                                         00000170
        IF(VALUE(I) .EQ. 0.0)GO TO 1000                                      00000180
        WRITE(5,20)                                                          00000190
   20   FORMAT(' ENTER COMMENTS:')                                           00000200
        READ(5,30)(COMENT(I,J),J=1,6)                                        00000210
   30   FORMAT(6A2)                                                          00000220
        WRITE(5,40)                                                          00000230
   40   FORMAT(' ENTER DATE:')                                               00000240
        READ(5,50)(DATE(I,J),J=1,3)                                          00000250
   50   FORMAT(3A4)                                                          00000260
   60 CONTINUE                                                               00000270
C                                                                            00000280
 1000 SUM=SUM-1                                                              00000290
      WRITE(8,70)SUM                                                         00000300
   70 FORMAT(I2)                                                             00000310
      WRITE(8,75)                                                            00000320
   75 FORMAT(T8,'** CURRENT  SOFTWARE  ESTIMATES DISPLAYED IN',             00000330
     1         ' MILLIONS**')                                                00000335
      WRITE(8,77)                                                            00000340
   77 FORMAT('                                                             ') 00000350
      WRITE(8,80)                                                            00000360
   80 FORMAT(T10,'VALUE',T22,'COMMENTS',T36,'DATE')                          00000370
      DO 100 I=1,SUM                                                         00000380
        WRITE(8,90)COUNT(I),VALUE(I),(COMENT(I,J),J=1,6),                    00000390
     1             (DATE(I,J),J=1,3)                                         00000400
   90   FORMAT(T4,I2,T7,F8.2,T23,6A2,T34,3A4)                                00000410
  100 CONTINUE                                                               00000420
      WRITE(5,110)                                                           00000430
  110 FORMAT('YOUR FILE HAS BEEN SAVED')                                     00000440
      STOP                                                                   00000450
      END                                                                    00000460
```


DATE
ILMED
-8